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*Refer To*: ADESH-15-063
*LAUR*: 15-20805
*Locates Action No.*: N/A

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NMED
Hazardous Waste Bureau

John Kieling, Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

**Subject: Submittal of the Periodic Monitoring Report for San Ildefonso Pueblo Locations within the General Surveillance Monitoring Group, June 2–October 30, 2014**

Dear Mr. Kieling:

Enclosed please find two hard copies with electronic files of the Periodic Monitoring Report (PMR) for San Ildefonso Pueblo Locations within the General Surveillance Monitoring Group, June 2–October 30, 2014.

This periodic monitoring report (PMR) presents analytical results from the Interim Facility-Wide Groundwater Monitoring Plan's General Surveillance Monitoring Group sampling locations within the boundary of the San Ildefonso Pueblo. Analytical results for this monitoring group's locations outside the Pueblo boundary were submitted in PMRs submitted on March 2, 2015.

This one-time submittal presents the results of sampling at locations on Pueblo land that were previously unreported. The memorandum of agreement between the U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA) and the Pueblo requires DOE/NNSA to provide a 60-day period for the Pueblo to review the data and consult on a draft of any document containing Confidential Pueblo Information or Sensitive Data arising from, or relating to, the Pueblo before the data are disclosed or the final report is prepared. DOE/NNSA received approval from the Pueblo to release the data on March 26, 2015.

36989

If you have any questions, please contact Steve Paris at (505) 606-0915 (smparis@lanl.gov) or Hai Shen at (505) 665-5046 (hai.shen@em.doe.gov).

Sincerely,

Alison M. Dorries, Division Leader
Environmental Protection Division
Los Alamos National Laboratory

Sincerely,

Christine Gelles, Acting Manager
Environmental Management
Los Alamos Field Office

AD/CG/DM/SP:sm

Enclosures: Two hard copies with electronic files – Periodic Monitoring Report for San Ildefonso Pueblo Locations within the General Surveillance Monitoring Group, June 2–October 30, 2014 (EP2015-0024)

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LA-UR-15-20805
April 2015
EP2015-0024

# Periodic Monitoring Report for San Ildefonso Pueblo Locations within the General Surveillance Monitoring Group, June 2–October 30, 2014

Los Alamos
NATIONAL LABORATORY
EST. 1943

Prepared by the Environmental Programs Directorate

Los Alamos National Laboratory, operated by Los Alamos National Security, LLC, for the U.S. Department of Energy under Contract No. DE-AC52-06NA25396, has prepared this document pursuant to the Compliance Order on Consent, signed March 1, 2005. The Compliance Order on Consent contains requirements for the investigation and cleanup, including corrective action, of contamination at Los Alamos National Laboratory. The U.S. government has rights to use, reproduce, and distribute this document. The public may copy and use this document without charge, provided that this notice and any statement of authorship are reproduced on all copies.

EP2015-0024

# Periodic Monitoring Report for San Ildefonso Pueblo Locations within the General Surveillance Monitoring Group, June 2–October 30, 2014

April 2015

Responsible project manager:

| Printed Name | Signature | Title | Organization | Date |
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Responsible LANS representative:

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| Randall Erickson | for R. Erickson | Acting Associate Director | Environmental Programs | 4/8/15 |

Responsible DOE representative:

| Printed Name | Signature | Title | Organization | Date |
|---|---|---|---|---|
| Christine Gelles | | Acting Manager | DOE-EM-LA | 4/23/15 |

## EXECUTIVE SUMMARY

This periodic monitoring report (PMR) provides the results that were withheld from previously submitted PMRs pending review by Pueblo de San Ildefonso. This review is required under the memorandum of agreement dated May 28, 2014, between the U.S. Department of Energy/National Nuclear Security Administration Los Alamos Field Office and the Pueblo de San Ildefonso.

This PMR provides results for locations in the San Ildefonso Pueblo portion of the General Surveillance monitoring group from the periodic monitoring events ([PMEs] collectively described in this document as "the PME") reported in the following:

- "Periodic Monitoring Report for Los Alamos and Pueblo Watershed General Surveillance Monitoring Group, June 2–June 18, 2014," for LA Canyon near Otowi Bridge, LLAO-1b, LLAO-4, Los Alamos Spring, and Vine Tree Spring;
- "Periodic Monitoring Report for Mortandad and Sandia Watershed General Surveillance Monitoring Group, July 8–July 25, 2014," for R-10 S1, R-10 S2, R-10a, and R-34; and
- "Periodic Monitoring Report for White Rock Canyon General Surveillance Monitoring Group, September 29–October 30, 2014," for Mortandad at Rio Grande, Rio Grande at Otowi Bridge, La Mesita Spring, Sacred Spring, Sandia Spring, Spring 1, and Spring 2.

The first two parts of the PME were conducted pursuant to the Interim Facility-Wide Groundwater Monitoring Plan for the 2014 Monitoring Year, October 2013–September 2014, prepared in accordance with the Compliance Order on Consent. The third part of the PME was conducted pursuant to the Interim Facility-Wide Groundwater Monitoring Plan for the 2015 Monitoring Year, October 2014–September 2015.

The PME documented in this report occurred from June 2 to October 30, 2014, and included the monitoring of groundwater wells or well screens, springs, and base-flow locations. This report also includes any results from previous PMEs that were unreported in their respective PMRs because validated laboratory data were not available (in some cases because of data release agreements). Any additional results from sampling that occurred outside the time frame of the current PME are also included in this report.

Water samples collected from various locations during this PME were analyzed for metals; volatile organic compounds; semivolatile organic compounds; high explosives; radionuclides, including low-level tritium; general inorganic chemicals, including perchlorate; stable isotopes; and field parameters (alkalinity, dissolved oxygen, pH, specific conductance, temperature, and turbidity).

No surface-water results from previous PME surface-water samples are reported in this PMR. For surface-water samples collected during this PME, no results were above screening levels.

One groundwater result from previous sampling of PME monitoring locations reported in this PMR was above screening levels. Two results from groundwater samples collected during this PME were above screening levels.

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Appendix F Analytical Reports (on CD included with this document)

**Plate**

Plate 1 Groundwater elevations

**Acronyms and Abbreviations**

| | |
|---|---|
| amsl | above mean sea level |
| AOC | area of concern |
| AQA | Analytical Quality Associates, Inc. |
| BCG | Biota Concentration Guide (DOE) |
| CAS | Chemical Abstracts Service |
| CFR | Code of Federal Regulations (U.S.) |
| Consent Order | Compliance Order on Consent |
| DCS | Derived Concentration Technical Standard (DOE) |
| DOE | Department of Energy (U.S.) |
| ESH | Environment, Safety, and Health (Directorate) |
| EPA | Environmental Protection Agency (U.S.) |
| F | filtered |
| gpm | gallons per minute |
| IFGMP | Interim Facility-Wide Groundwater Monitoring Plan |
| LANL | Los Alamos National Laboratory |
| MCL | maximum contaminant level (EPA) |
| MDL | method detection limit |
| N | no (best value flag code) |
| NMED | New Mexico Environment Department |
| NM HH OO | Human health organism only, New Mexico surface-water standards |
| NMWQCC | New Mexico Water Quality Control Commission |
| PME | periodic monitoring event |
| PMR | periodic monitoring report |
| PQL | practical quantitation limit |
| QC | quality control |
| RLWTF | Radioactive Liquid Waste Treatment Facility |
| SOP | standard operating procedure |
| SWMU | solid waste management unit |
| TA | technical area |
| UF | unfiltered |
| Y | yes (best value flag code) |

## 1.0 INTRODUCTION

This periodic monitoring report (PMR) provides the results that were withheld from previously submitted PMRs pending review by Pueblo de San Ildefonso. This review is required under the memorandum of agreement dated May 28, 2014, between the U.S. Department of Energy (DOE)/National Nuclear Security Administration Los Alamos Field Office and the Pueblo de San Ildefonso.

This PMR provides results in the San Ildefonso Pueblo portion of the General Surveillance monitoring group for locations from the periodic monitoring events ([PMEs] collectively described in this document as "the PME") reported in the following:

- "Periodic Monitoring Report for Los Alamos and Pueblo Watershed General Surveillance Monitoring Group, June 2–June 18, 2014" (LANL 2014, 600057) for LA Canyon near Otowi Bridge, LLAO-1b, LLAO-4, Los Alamos Spring, and Vine Tree Spring;
- "Periodic Monitoring Report for Mortandad and Sandia Watershed General Surveillance Monitoring Group, July 8–July 25, 2014" (LANL 2014, 600059) for R-10 S1, R-10 S2, R-10a, and R-34; and
- "Periodic Monitoring Report for White Rock Canyon General Surveillance Monitoring Group, September 29–October 30, 2014" (LANL 2015, 600249) for Mortandad at Rio Grande, Rio Grande at Otowi Bridge, La Mesita Spring, Sacred Spring, Sandia Spring, Spring 1, and Spring 2.

The first two parts of the PME were conducted pursuant to the Interim Facility-Wide Groundwater Monitoring Plan for the 2014 Monitoring Year, October 2013–September 2014 (2014 IFGMP) (LANL 2013, 241962), prepared in accordance with the Compliance Order on Consent (the Consent Order). The third part of the PME was conducted pursuant to the Interim Facility-Wide Groundwater Monitoring Plan for the 2015 Monitoring Year, October 2014–September 2015 (2015 IFGMP) (LANL 2014, 256728). The PME documented in this report occurred from June 2 to October 30, 2014, and included the monitoring of groundwater wells or well screens, springs, and base-flow locations.

This report also includes any results from previous PMEs that were unreported in their respective PMRs because validated laboratory data were not available (in some cases because of data release agreements). Any additional results from sampling that occurred outside the time frame of a PME are also included in this report.

Sections VIII.A and VIII.C of the Consent Order identify New Mexico Water Quality Control Commission (NMWQCC) groundwater and surface-water standards, including alternative abatement standards and U.S. Environmental Protection Agency (EPA) drinking water maximum contaminant levels (MCLs), as cleanup levels for groundwater when corrective action is implemented. NMWQCC groundwater standards, MCLs, and EPA regional screening levels for tap water are used as screening levels for monitoring data and are provided in this report.

This report presents the following information:

- general background information on the monitoring group
- field-measurement monitoring results
- water-quality monitoring results
- screening analysis results (comparing these PME results with screening levels and results from previous reports)
- a summary based on the data and the screening analysis

Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department (NMED) in accordance with DOE policy.

## 1.1 Background

Most of the monitoring wells discussed in the 2014 IFGMP (LANL 2013, 241962) and the 2015 IFGMP (LANL 2014, 256728) are assigned to area-specific monitoring groups related to project areas that may be located in more than one watershed. Locations that are not included within one of these six area-specific monitoring groups are assigned to the General Surveillance monitoring group. This PMR presents results from the San Ildefonso Pueblo portion of the General Surveillance monitoring group.

### 1.1.1 Los Alamos and Pueblo Watershed

Some of the wells in the Los Alamos and Pueblo watershed are assigned to the Los Alamos and Pueblo watershed portion of the General Surveillance monitoring group. Other wells in Los Alamos Canyon are assigned to the Technical Area 21 (TA-21) monitoring group. The TA-21 monitoring group is located in and around TA-21 and is primarily located in upper Los Alamos Canyon. TA-21 is located on the mesa north of Los Alamos Canyon, which is joined by DP Canyon, east of TA-21. TA-21 consists of two past operational areas, DP West and DP East, both of which produced liquid and solid radioactive wastes. The operations at DP West included plutonium processing, while the operations at DP East included the production of weapons initiators and tritium research.

From 1952 to 1986, a liquid-waste treatment plant discharged effluent containing radionuclides from the former plutonium-processing facility at TA-21 into DP Canyon. Primary sources of contaminants in the vicinity of the TA-21 monitoring group include the effluent outfall [Solid Waste Management Unit (SWMU) 21-011(k)], the adsorption beds and disposal shafts at Material Disposal Area T, DP West, and waste lines and sumps. Other potential sources include DP East and leakage from an underground diesel fuel line. The monitoring objectives for the TA-21 monitoring group are based in part on the results and conclusions presented in the Los Alamos and Pueblo Canyons Investigation Report (LANL 2004, 087390) as well as on the NMED-approved Los Alamos and Pueblo Canyons Groundwater Monitoring Well Network Evaluation and Recommendations, Revision 1 (LANL 2008, 101330).

Los Alamos Canyon received releases of radioactive effluents during the earliest Manhattan Project operations at TA-01 (1942–1945) and until 1993 from nuclear reactors at TA-02. Los Alamos Canyon also received radionuclides and metals in discharges from the sanitary sewage lagoons and cooling towers at the Los Alamos Neutron Science Center at TA-53. Except for strontium-90, contaminant concentrations in shallow groundwater have decreased dramatically in recent decades.

Pueblo Canyon receives effluent from the new Los Alamos County Wastewater Treatment Plant (completed in 2007). Acid Canyon, a tributary, received radioactive industrial effluent from 1943 to 1964. Compared with past decades, little radioactivity is found in current groundwater samples.

### 1.1.2 Mortandad and Sandia Watershed

Some of the wells in the Mortandad and Sandia watershed are assigned to the Mortandad and Sandia watershed portion of the General Surveillance monitoring group. Other wells in Mortandad and Sandia Canyons are assigned to the Chromium Investigation monitoring group, which is located in Mortandad and Sandia Canyons. Monitoring focuses on the characterization and fate and transport of chromium contamination in intermediate-perched groundwater and within the regional aquifer. The distribution of wells in the monitoring group also addresses historical releases from Outfall 051, which

discharges from the Radioactive Liquid Waste Treatment Facility (RLWTF) in the Mortandad Canyon watershed. Effluent discharge was suspended in 2011 because of process changes at the RLWTF.

Sandia Canyon heads on Laboratory property within TA-03 at an elevation of approximately 7300 ft and trends east-southeast across the Laboratory, Bandelier National Monument, and San Ildefonso Pueblo. Sandia Canyon empties into the Rio Grande in White Rock Canyon at an elevation of 5450 ft. The area of the Sandia Canyon watershed is approximately 5.5 $mi^2$. Perennial stream flow and saturated alluvial groundwater conditions occur in the upper and middle portions of the canyon system because sanitary wastewater and cooling tower effluent discharge to the canyon from operating facilities. A wetland of approximately 7 acres has developed as a result of the effluent discharge. The only known perennial spring in the watershed (Sandia Spring) is located in lower Sandia Canyon near the Rio Grande. TAs located in the Sandia Canyon watershed include TA-03, TA-53, TA-60, TA-61, TA-72, and former TA-20. A total of 264 SWMUs and areas of concern (AOCs) are located within the portions of these TAs in the Sandia Canyon watershed.

Mortandad Canyon is an east-to-southeast trending canyon that heads on the Pajarito Plateau near the main Laboratory complex at TA-03 at an elevation of 7380 ft. The drainage extends about 9.6 mi from its headwaters to its confluence with the Rio Grande at an elevation of 5440 ft. The canyon crosses San Ildefonso Pueblo land for several miles before joining the Rio Grande (LANL 1997, 056835). The Mortandad Canyon watershed is located in the central portion of the Laboratory and covers approximately 10 $mi^2$. The Mortandad Canyon watershed contains several tributary canyons that have received contaminants released during Laboratory operations, including Ten Site Canyon, Pratt Canyon, Effluent Canyon, and Cañada del Buey. TAs located in the Mortandad Canyon watershed include TA-03, TA-05, TA-35, TA-48, TA-50, TA-52, TA-55, TA-60, TA-63, former TA-04, and former TA-42. A total of 257 SWMUs and AOCs are located within the portions of these TAs in the Mortandad Canyon watershed.

Chromium concentrations exceed the NMED groundwater standard in Mortandad Canyon regional aquifer wells R-28, R-62, R-42, R-43, and R-50. Other constituents detected above background in wells in the monitoring group include nitrate, perchlorate, and tritium. A conceptual model for the sources and distribution of these contaminants is presented in the Investigation Report for Sandia Canyon (LANL 2009, 107453) and the Phase II Investigation Report for Sandia Canyon (LANL 2012, 228624).

The conceptual model hypothesizes that chromium and other contaminants originate from releases into Sandia Canyon with lateral migration pathways that move contamination to locations beneath Mortandad Canyon. For this reason, intermediate-perched and regional wells beneath Mortandad Canyon are included in the Chromium Investigation monitoring group. Other areas of contamination beneath Sandia and Mortandad Canyons may be associated with Mortandad Canyon sources. These sources and the migration pathways are described in the Investigation Report for Sandia Canyon (LANL 2009, 107453) and the Phase II Investigation Report for Sandia Canyon (LANL 2012, 228624).

### 1.1.2 White Rock Canyon

The Rio Grande flows from northeast to southwest in the vicinity of the Laboratory and forms a part of the eastern Laboratory boundary. The White Rock Canyon springs are located along the Rio Grande at the eastern border of the Laboratory and on Los Alamos County and San Ildefonso Pueblo lands. The springs serve as monitoring points to detect possible discharges of contaminated groundwater from beneath the Laboratory into the Rio Grande. The White Rock springs are one of the most frequently monitored locations in or next to the Laboratory. Most of the major springs have been sampled regularly since the late 1960s, with some sampled since the early 1950s.

Tritium operations took place at TA-33. The Resource Conservation and Recovery Act facility investigation work plan for Operable Unit 1122 (LANL 1992, 007671) describes environmental concerns at TA-33. A total of 60 SWMUs and AOCs are located within TA-33. To the north of TA-33 lies TA-70, a buffer area where no Laboratory activities have occurred. There are no SWMUs or AOCs within TA-70. Adjoining TA-70 to the north are low- to moderate-density residential areas in White Rock, a mix of private property, and Los Alamos County land. A municipal sanitary treatment plant discharges effluent into Mortandad Canyon just above the river at the northern county boundary. San Ildefonso Pueblo property borders Los Alamos County on the north; this land is undeveloped. San Ildefonso Pueblo operates numerous water-supply wells on both sides of the Rio Grande, and the City of Santa Fe operates the Buckman well field on the east side of the Rio Grande across from White Rock.

## 2.0 SCOPE OF ACTIVITIES

The first two parts of the PME in the San Ildefonso Pueblo portion of the General Surveillance monitoring group were conducted pursuant to the 2014 IFGMP (LANL 2013, 241962), prepared in accordance with the Compliance Order on Consent. The third part of the PME was conducted pursuant to the 2015 IFGMP (LANL 2014, 256728).

Table 2.0-1 provides the location name, sample collection date, screened interval, top and bottom screen depths, casing volume, purge volume, and purge or flow rate for each of the locations scheduled to be monitored. These locations are shown in Figure 2.0-1. Some locations on this map may not have been sampled.

## 3.0 MONITORING RESULTS

### 3.1 Methods and Procedures

All methods and procedures used to perform the field activities associated with the PME are documented in the 2014 IFGMP (LANL 2013, 241962) and the 2015 IFGMP (LANL 2014, 256728).

### 3.2 Field Parameter Results

Appendix A contains the field parameter results for this PME and for the four previous PMEs.

### 3.3 Groundwater Elevations and Base-Flow Observations

The periodic monitoring water-level data for the previous 2 yr are presented in Appendix B (on CD included with this document). For wells equipped with transducers, the reported water level is the water-level measurement taken earliest on the day of sampling. All manual measurements were recorded immediately before sampling. The groundwater-elevation measurements are shown graphically on Plate 1. Base-flow measurements are shown graphically in Figure 3.3-1.

### 3.4 Deviations from Planned Scope

Table 3.4-1 describes the fieldwork deviations from the planned scope of the PME.

Different analytical methods were used to analyze some of the organic compounds presented in this report. For Los Alamos Canyon samples collected at Vine Tree Spring and LLAO-4, Table 3.4-2 presents a list of analytes for which the method detection limits (MDLs) are greater than screening levels. For some of these analytes, the MDL is much lower than for earlier analyses. Table 3.4-3 presents a list of analytes for which the MDLs for these samples are now below screening levels.

For White Rock Canyon samples, Table 3.4-4 presents a list of analytes for which the MDLs are greater than screening levels. Some of the analytes were measured using more than one analytical method or analytical laboratory, leading to a range of MDLs. Table 3.4-5 presents a list of analytes for which the MDLs for these samples are now below screening levels. The tables apply to the results with the lowest MDL, so the analytical method and analytical laboratory are included in the tables for reference.

## 4.0 ANALYTICAL DATA RESULTS

### 4.1 Methods and Procedures

All methods and procedures used to perform the analytical activities of the PME are documented in the 2014 IFGMP (LANL 2013, 241962) and the 2015 IFGMP (LANL 2014, 256728). Purge water is managed and characterized in accordance with waste profile form 39268, a copy of which was included in Appendix F of a previous PMR (LANL 2008, 103737), and ENV-RCRA-QP-010.3, Land Application of Groundwater. ENV-RCRA-QP-010.3 implements the NMED-approved Notice of Intent Decision Tree for land application of drilling, development, rehabilitation, and sampling of purge water.

All sampling, data reviews, and data package validations were conducted using standard operating procedures (SOPs) that are part of a comprehensive quality assurance program. The procedures are listed at http://www.lanl.gov/community-environment/environmental-stewardship/plans-procedures.php and are available at eprr.lanl.gov. Completed chain-of-custody forms serve as analytical request forms and include the requester or owner, sample number, program code, date and time of sample collection, total number of bottles, list of analytes to be measured, bottle sizes, and preservatives for each required analysis.

The required analytical laboratory batch quality control (QC) is defined by the analytical method, the analytical statement of work, and generally accepted laboratory practices. The analytical laboratory assigns qualifiers to the data to indicate the quality of the analytical results. The laboratory batch QC is used in the secondary data validation process to evaluate the quality of individual analytical results, evaluate the appropriateness of the analytical methodologies, and measure the routine performance of the analytical laboratory.

In addition to batch QC performed by laboratories, the Laboratory submitted field QC samples to test the overall sampling and analytical laboratory process and to spot-check for analytical problems. These results are used in secondary validation along with information provided by the analytical laboratory.

After the Laboratory receives the analytical laboratory data packages, the packages receive secondary validation. For data collected before March 2012, validation was done by an independent contractor, Analytical Quality Associates, Inc. (AQA). After that date, validation is done by an automated process after data are loaded.

Data validation determines the quality of an analytical data set. Data validation focuses on specific quality assurance samples, such as matrix spikes, duplicates, surrogates, method blanks, and laboratory control samples, and holding times, which indicate the accuracy and precision of the analyses. Based on the results, data qualifiers are applied to indicate data quality issues as well as the usability of results. This process also includes a description of the reasons for any failure to meet method, procedural, or contractual requirements and an evaluation of the impact of such failure on the overall data set.

AQA's reviews follow the guidelines set in the DOE model SOP for data validation, which includes reviewing the data quality and the documentation's correctness and completeness, verifying that holding times were met, and ensuring that analytical laboratory QC measures were applied, documented, and kept within contract requirements. As a result of secondary validation, a second set of qualifiers was assigned to the analytical results.

Auto validation (1) ensures that the electronic data deliverable contains all the required fields, (2) verifies that results of all QC checks and procedures are within valid criteria limits, and (3) applies specific qualifiers and reason codes per the EPA's National Functional Guidelines for data review as well as the Laboratory's SOPs. Once auto validation is complete, the data are uploaded into the Laboratory's database system and the public database (http://intellusnm.com/).

The Laboratory assigns detection status to the analytical result based on the analytical laboratory and secondary validation qualifiers. A detect flag of "N" indicates that, based on the qualifiers, the result was not detected.

### 4.2 Analytical Data

Appendix C presents the analytical data from this PME and from the four sampling events at these locations immediately before the PME. The analytical laboratory reports (including chain-of-custody forms and data validation forms) are provided in Appendix F (on CD included with this document).

Appendix C contains all data collected during the PME (i.e., all data that have been independently reviewed for conformance with Laboratory requirements) with the following constraints.

- All data
  - Data that are R-qualified (rejected because of noncompliance regarding QC acceptance criteria) during independent validation are considered unusable but are still reported.
  - Analytical laboratory QC results, including matrix spike and matrix spike duplicates, and field blanks, trip blanks, and equipment blanks are not included in the data set.
  - Field duplicates, reanalyses, and results from different analytical methods are reported.
- Radionuclides
  - Only cesium-137, cobalt-60, neptunium-237, potassium-40, and sodium-22 are reported (or analyzed) for the gamma spectroscopy suite.
  - Americium-241 and uranium-235 are reported only by chemical separation alpha spectroscopy. No gamma spectroscopy results are presented for these analytes.
  - Otherwise, all results are reported at all locations.
- Nonradionuclides
  - All detected results are reported.

Multiple analyses of a sample, including dilutions and reanalyses, create redundant results. These multiple results have the same sample ID, analytical laboratory code, and analytical method. The analytical and validation information is used to designate the preferred result, which is marked with a best value flag of "Y" (yes). The redundant values of lower quality are assigned a best value flag of "N" (no). In cases where a reanalysis gives a significantly different result than an earlier value, the original result may be rejected and assigned a best value flag of N, and the reanalysis result may be marked with a best value flag of Y. The best value flag is included in Appendix C.

Data for PMRs are evaluated using the following screening process. The sources of screening levels with which the results are compared are listed in Table 4.2-1.

- The base-flow monitoring locations are assigned to one of two screening categories—perennial or ephemeral (Table 4.2-2). Along with a hardness value, this category determines the screening levels used for data at each monitoring location. Hardness-dependent screening levels used to screen data at each base-flow monitoring location are determined using the geometric mean of hardness data (mg/L as calcium carbonate) collected from 2006 to 2010 at each location (Table 4.2-2). Hardness-dependent acute and chronic criteria were used for total aluminum and dissolved cadmium, chromium, copper, lead, manganese, nickel, silver, and zinc in accordance with the requirements of 20 New Mexico Administrative Code (NMAC) 6.4.
- Surface-water and groundwater perchlorate data were compared with the screening level of 4 µg/L established in Section VIII.A.1.a of the Consent Order.
- Other groundwater data are screened to groundwater cleanup levels described in Section VIII.A.1 of the Consent Order; for an individual substance, the lesser of the EPA MCL or the NMWQCC groundwater standard is used.
- If an NMWQCC standard or an MCL has not been established for a specific substance for which toxicological information is published, the EPA regional screening levels for tap water (formerly Region 6 screening levels for tap water) are used as the groundwater cleanup level. These screening levels are for either a cancer- or noncancer-risk type. The Consent Order specifies screening at a $10^{-5}$ excess cancer risk. The EPA screening levels are for $10^{-6}$ excess cancer risk, so 10 times the EPA $10^{-6}$ screening levels are used for screening. This report was prepared using the May 2014 EPA regional screening levels for the first two parts of the PME and the November 2014 EPA regional screening levels for the third part of the PME.
- The NMWQCC groundwater standards apply to the dissolved (filtered) portion of specified contaminants; however, the standards for mercury, organic compounds, and nonaqueous-phase liquids apply to the total unfiltered concentrations of the contaminants. EPA MCLs are applied to both filtered and unfiltered sample results.
- The analytical results for radioactivity are compared with the DOE Biota Concentration Guides (BCGs) for surface water and Derived Concentration Technical Standards (DCSs) for groundwater.

The results of data screening for this PMR are presented in Appendix D. This appendix shows all analytical results greater than half the lowest applicable screening levels. Results with a best value flag of N are included in Appendix D but not discussed in the text.

Table 4.2-3 provides groundwater analytical results (by hydrogeologic zone for a specific analytical suite) that are above screening levels. Multiple detections of a particular constituent at a location are counted as one result. For example, if aluminum is detected above a screening level in both a primary sample and a field duplicate, only the highest result is shown.

Graphs in Appendix E display concentration histories of analytes for locations where the analyte was above its screening level at least once during the three most recent PMEs. Appendix E contains all locations where screening levels were exceeded, not just those scheduled to be sampled during this PME. Concentrations of the analyte are plotted for a 3-yr period. If 3 yr of data are not available, then all available results for the analyte are plotted. When shown, the solid red lines depict applicable screening levels. Results with a best value flag of N are not included in Appendix E.

No analytes from the current PME exceeded their screening levels at more than one sampling location, so no maps showing concentrations are included.

#### 4.2.1 Surface Water (Base Flow)

No results from previous PME surface-water samples are reported in this PMR. No results from surface-water samples collected during this PME were above screening levels.

#### 4.2.2 Groundwater

At intermediate Vine Tree Spring on San Ildefonso Pueblo land, the perchlorate concentrations of 5.66 µg/L from a December 17, 2013, sample and 5.89 µg/L from a sample collected for the current PME on June 18, 2014, were above the 4-µg/L Consent Order screening level (Table 4.2-3). Vine Tree Spring is a few feet from Basalt Spring, which has been monitored since the 1960s. Basalt Spring apparently dried up, and discharge moved to Vine Tree Spring, where samples have been collected since 2011. Together, the perchlorate concentrations at Vine Tree Spring and Basalt Spring have been near or above the screening level since late 2008. Five previous measurements at Vine Tree Spring since August 2011 range from 4.86 µg/L to 5.58 µg/L. The result for the current PME is the highest measured at the spring.

The manganese concentration of 679 µg/L in a filtered primary sample from Sacred Spring on San Ildefonso Pueblo land was above the NMWQCC groundwater standard screening level of 200 µg/L (applicable to domestic water supply). The concentration was 706 µg/L in a field duplicate sample. Other results since 2000 range from nondetect (<2.29 µg/L) to 994 µg/L.

### 4.3 Sampling Program Modifications

No modifications to the periodic monitoring sampling for the San Ildefonso Pueblo portion of the General Surveillance monitoring group are proposed at this time.

## 5.0 SUMMARY AND INTERPRETATIONS

### 5.1 Monitoring Results

The field parameter monitoring results are presented in Appendix A.

### 5.2 Analytical Results

#### 5.2.1 Surface Water (Base Flow)

No results from previous PME surface-water samples are reported in this PMR. No results from surface-water samples collected during this PME were above screening levels.

#### 5.2.2 Groundwater

One groundwater result from previous sampling of PME monitoring locations reported in this PMR was above screening levels. Two results from groundwater samples collected during this PME were above screening levels (Table 4.2-3).

For results above screening levels, the types of contaminants detected and their concentrations are consistent with data reported from previous PMEs in this monitoring group, with some exceptions. The perchlorate concentration from the current PME at Vine Tree Spring is the highest to date.

### 5.3 Data Gaps

Table 3.4-1 summarizes the field deviations encountered during this PME. The table provides a detailed account of sampling event deviations.

### 5.4 Remediation System Monitoring

Remediation system monitoring is not applicable to the San Ildefonso Pueblo portion of the General Surveillance monitoring group because no systems are installed in the monitoring group area.

## 6.0 REFERENCES

*The following list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ER ID or ESH ID. This information is also included in text citations. ER IDs were assigned by the Environmental Programs Directorate's Records Processing Facility (IDs through 599999), and ESH IDs are assigned by the Environment, Safety, and Health (ESH) Directorate (IDs 600000 and above). IDs are used to locate documents in the Laboratory's Electronic Document Management System and, where applicable, in the master reference set.*

*Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the ESH Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.*

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1122," Los Alamos National Laboratory document LA-UR-92-925, Los Alamos, New Mexico. (LANL 1992, 007671)

LANL (Los Alamos National Laboratory), September 1997. "Work Plan for Mortandad Canyon," Los Alamos National Laboratory document LA-UR-97-3291, Los Alamos, New Mexico. (LANL 1997, 056835)

LANL (Los Alamos National Laboratory), April 2004. "Los Alamos and Pueblo Canyons Investigation Report," Los Alamos National Laboratory document LA-UR-04-2714, Los Alamos, New Mexico. (LANL 2004, 087390)

LANL (Los Alamos National Laboratory), February 2008. "Los Alamos and Pueblo Canyons Groundwater Monitoring Well Network Evaluation and Recommendations, Revision 1," Los Alamos National Laboratory document LA-UR-08-1105, Los Alamos, New Mexico. (LANL 2008, 101330)

LANL (Los Alamos National Laboratory), September 2008. "Periodic Monitoring Report for White Rock Watershed, April 23–April 30, 2008," Los Alamos National Laboratory document LA-UR-08-5847, Los Alamos, New Mexico. (LANL 2008, 103737)

LANL (Los Alamos National Laboratory), October 2009. "Investigation Report for Sandia Canyon," Los Alamos National Laboratory document LA-UR-09-6450, Los Alamos, New Mexico. (LANL 2009, 107453)

LANL (Los Alamos National Laboratory), September 2012. "Phase II Investigation Report for Sandia Canyon," Los Alamos National Laboratory document LA-UR-12-24593, Los Alamos, New pMexico. (LANL 2012, 228624)

LANL (Los Alamos National Laboratory), May 2013. "Interim Facility-Wide Groundwater Monitoring Plan for the 2014 Monitoring Year, October 2013–September 2014," Los Alamos National Laboratory document LA-UR-13-23479, Los Alamos, New Mexico. (LANL 2013, 241962)

LANL (Los Alamos National Laboratory), May 2014. "Interim Facility-Wide Groundwater Monitoring Plan for the 2015 Monitoring Year, October 2014–September 2015," Los Alamos National Laboratory document LA-UR-14-23327, Los Alamos, New Mexico. (LANL 2014, 256728)

LANL (Los Alamos National Laboratory), November 2014. "Periodic Monitoring Report for Los Alamos and Pueblo Watershed General Surveillance Monitoring Group, June 2–June 18, 2014," Los Alamos National Laboratory document LA-UR-14-28077, Los Alamos, New Mexico. (LANL 2014, 600057)

LANL (Los Alamos National Laboratory), November 2014. "Periodic Monitoring Report for Mortandad and Sandia Watershed General Surveillance Monitoring Group, July 8–July 25, 2014," Los Alamos National Laboratory document LA-UR-14-28081, Los Alamos, New Mexico. (LANL 2014, 600059)

LANL (Los Alamos National Laboratory), February 2015. "Periodic Monitoring Report for White Rock Canyon General Surveillance Monitoring Group, September 29–October 30, 2014," Los Alamos National Laboratory document LA-UR-15-20504, Los Alamos, New Mexico. (LANL 2015, 600249)

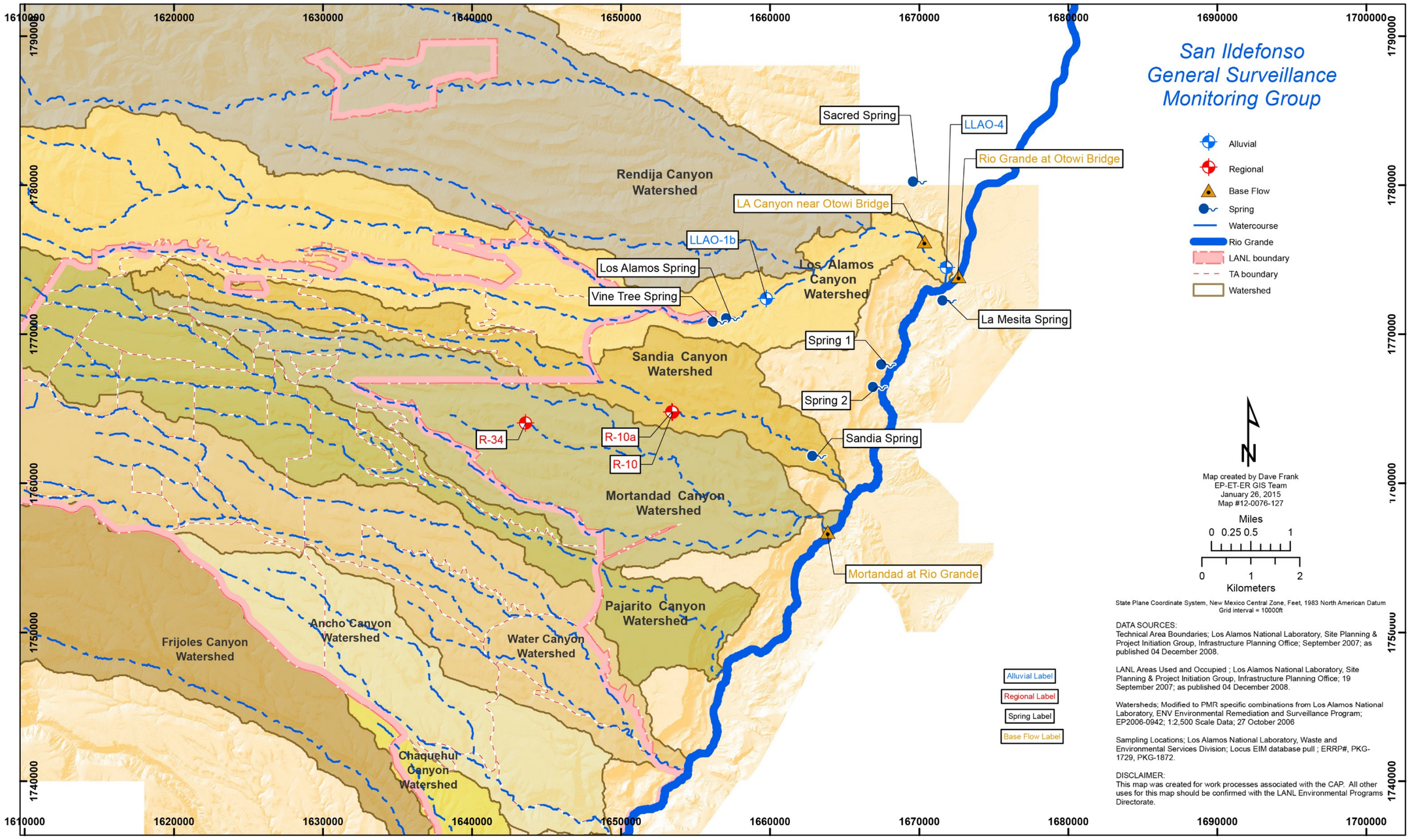



**Figure 2.0-1 Locations scheduled to be monitored for this PME (see Table 3.4-1)**

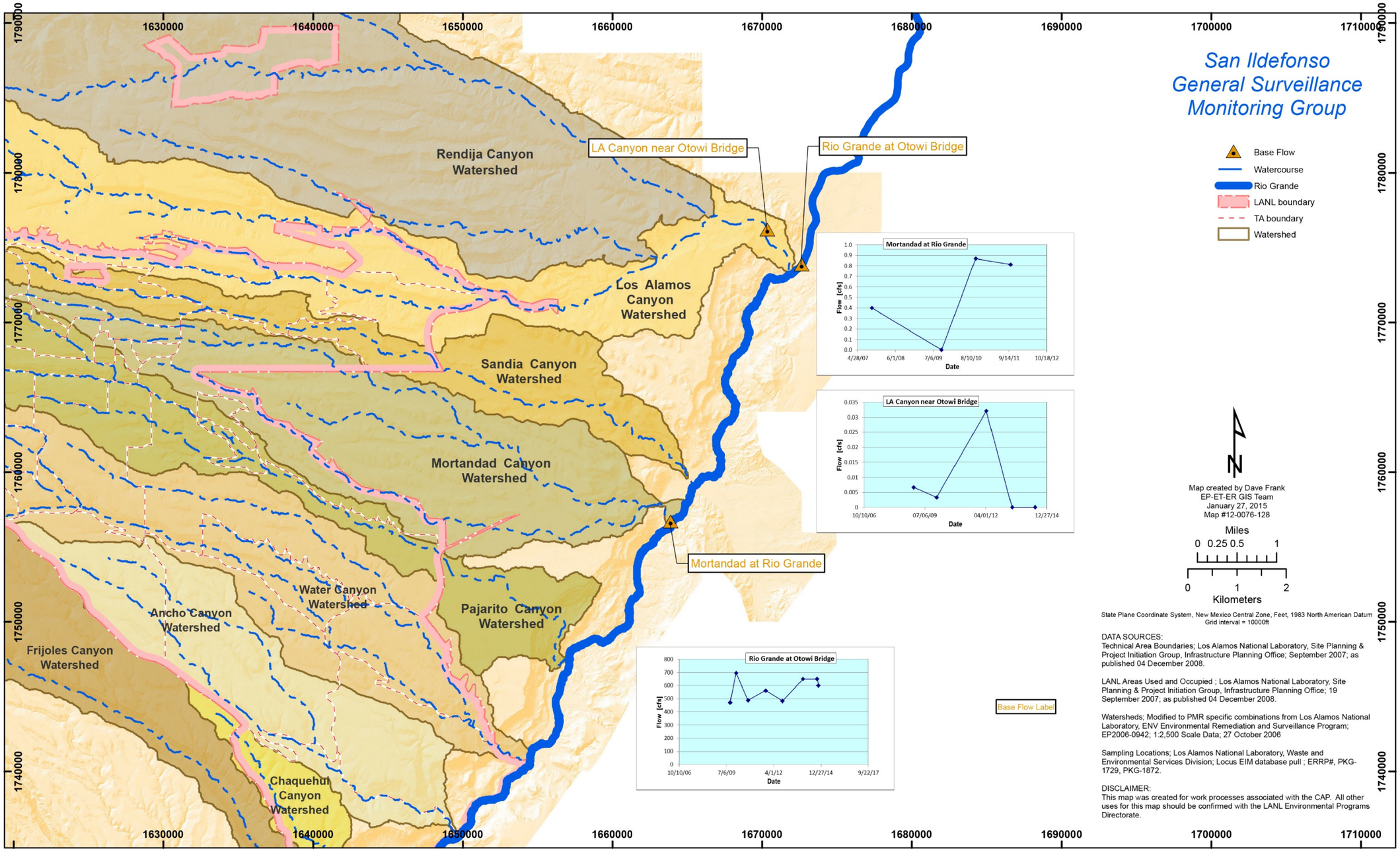



**Figure 3.3-1 Base-flow measurements**

**Table 2.0-1**
**San Ildefonso Pueblo General Surveillance Monitoring Group Locations and General Information**

| Location | Sample Collection Date | Screened Interval (ft) | Screen Top Depth (ft) | Screen Bottom Depth (ft) | Calculated Single Casing Volume (gal.) | Purge Volume (gal.) | Purge or Flow Rate (gpm[a]) |
|---|---|---|---|---|---|---|---|
| **Base Flow** | | | | | | | |
| LA Canyon near Otowi Bridge | n/a[b] | n/a | n/a | n/a | n/a | n/a | n/a[c] |
| Mortandad at Rio Grande | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Rio Grande at Otowi Bridge | 10/06/14 | n/a | n/a | n/a | n/a | n/a | 291,740 |
| Rio Grande at Otowi Bridge | 10/30/14 | n/a | n/a | n/a | n/a | n/a | 268,850 |
| **Alluvial** | | | | | | | |
| LLAO-1b | n/a | 10 | 11.32 | 21.32 | n/a | n/a | n/a |
| LLAO-4 | 06/17/14 | 10 | 5.24 | 15.24 | 7.7 | 7.7 | 0.24 |
| **Intermediate Springs** | | | | | | | |
| Los Alamos Spring | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Vine Tree Spring | 06/18/14 | n/a | n/a | n/a | n/a | n/a | 7.6 |
| **Regional** | | | | | | | |
| R-10 S1 | n/a | 23 | 874 | 897 | n/a | n/a | n/a |
| R-10 S2 | n/a | 23 | 1042 | 1065 | n/a | n/a | n/a |
| R-10a | n/a | 10 | 690 | 700 | n/a | n/a | n/a |
| R-34 | n/a | 22.9 | 883.7 | 906.6 | n/a | n/a | n/a |
| **Regional Springs** | | | | | | | |
| La Mesita Spring | 10/06/14 | n/a | n/a | n/a | n/a | n/a | 0.40 |
| La Mesita Spring | 10/29/14 | n/a | n/a | n/a | n/a | n/a | 0.17 |
| Sacred Spring | 10/30/14 | n/a | n/a | n/a | n/a | n/a | 4.49 |
| Sandia Spring | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Spring 1 | 09/29/14 | n/a | n/a | n/a | n/a | n/a | 3.14 |
| Spring 2 | 09/29/14 | n/a | n/a | n/a | n/a | n/a | 0.17 |
| Spring 2 | 10/29/14 | n/a | n/a | n/a | n/a | n/a | 0.40 |

[a] gpm = Gallons per minute.

[b] n/a = Not applicable.

**Table 3.4-1**
**San Ildefonso Pueblo General Surveillance Monitoring Group PME Observations and Deviations**

| Location | Deviation | Cause | Comment |
|---|---|---|---|
| Mortandad at Rio Grande | No data are included in this report for this location. | The site was dry, so no sample was collected. | This location will be sampled during the next scheduled PME. |
| Sandia Spring | No data are included in this report for this location. | Flow was insufficient for sample collection, so no sample was collected. | This location will be sampled during the next scheduled PME. |
| La Mesita Spring, Rio Grande at Otowi Bridge, Spring 2 | Two visits were required to collect samples. | Incomplete samples were collected during the initial visit because of the late completion of the sampling agreement with Pueblo de San Ildefonso. | n/a* |
| LLAO-1b | No data are included in this report for this location. | The location was not sampled because it was dry. | This location will be sampled during the next scheduled PME. |
| Los Alamos Spring | No data are included in this report for this location. | The location was not sampled because it was dry. | This location will be sampled during the next scheduled PME. |
| LA Canyon near Otowi Bridge | No data are included in this report for this location. | The location was not sampled because it was dry. | This location will be sampled during the next scheduled PME. |
| R-10 S1, R-10 S2, R-10a, and R-34 | No data are included in this report for these locations. | The access agreement with the Pueblo de San Ildefonso was pending when these locations were scheduled for sampling. | These locations will be sampled during the next scheduled PME. |

*n/a = Not applicable.

**Table 3.4-2**
**Analytes with MDLs above Screening Levels (Los Alamos Canyon Samples)**

| Analyte or CAS[a] No. | Analyte Name | MDL | PQL[b] | Screening Level | Unit | Screening-Level Type |
|---|---|---|---|---|---|---|
| **Semivolatile Organic Compounds** | | | | | | |
| 103-33-3 | Azobenzene | 3.12 | 10.39 | 1.2 | µg/L | EPA Regional Tap |
| 92-87-5 | Benzidine | 4.05 | 10.39 | 0.00110 | µg/L | EPA Regional Tap |
| 111-44-4 | Bis(2-chloroethyl)ether | 3.12 | 10.39 | 0.14 | µg/L | EPA Regional Tap |
| 91-94-1 | Dichlorobenzidine[3,3'-] | 3.12 | 10.39 | 0.28 | µg/L | NM HH OO[c] |
| 534-52-1 | Dinitro-2-methylphenol[4,6-] | 3.12 | 10.39 | 1.5 | µg/L | EPA Regional Tap |
| 118-74-1 | Hexachlorobenzene | 0.00650 | 0.0208 | 0.0029 | µg/L | NM HH OO |
| 55-18-5 | Nitrosodiethylamine[N-] | 3.12 | 10.39 | 0.0017 | µg/L | EPA Regional Tap |
| 62-75-9 | Nitrosodimethylamine[N-] | 3.12 | 10.39 | 0.0049 | µg/L | EPA Regional Tap |
| 924-16-3 | Nitroso-di-n-butylamine[N-] | 3.12 | 10.39 | 0.027 | µg/L | EPA Regional Tap |
| 621-64-7 | Nitroso-di-n-propylamine[N-] | 3.12 | 10.39 | 0.11 | µg/L | EPA Regional Tap |
| 930-55-2 | Nitrosopyrrolidine[N-] | 3.12 | 10.39 | 0.37 | µg/L | EPA Regional Tap |
| **Volatile Organic Compounds** | | | | | | |
| 107-02-8 | Acrolein | 1.5 | 5.0 | 0.042 | µg/L | EPA Regional Tap |
| 107-13-1 | Acrylonitrile | 1.05 | 5.0 | 0.52 | µg/L | EPA Regional Tap |
| 126-99-8 | Chloro-1,3-butadiene[2-] | 0.210 | 1.0 | 0.19 | µg/L | EPA Regional Tap |
| 96-18-4 | Trichloropropane[1,2,3-] | 0.3 | 1.0 | 0.0075 | µg/L | EPA Regional Tap |

Note: This table is applicable to samples reported in this PMR and collected before 9/29/14.

[a] CAS = Chemical Abstracts Service.

[b] PQL = Practical quantitation limit.

[c] NM HH OO = Human health organism only, New Mexico surface-water standards.

**Table 3.4-3**
**Analytes with MDLs Now below Screening Levels (Los Alamos Canyon Samples)**

| Analyte or CAS[a] No. | Analyte Name | MDL | PQL[b] | Screening Level | Unit | Screening-Level Type |
|---|---|---|---|---|---|---|
| **Semivolatile Organic Compounds** | | | | | | |
| 56-55-3 | Benzo(a)anthracene | 0.0168 | 0.0524 | 0.18 | µg/L | NM HH OO[c] |
| 50-32-8 | Benzo(a)pyrene | 0.0168 | 0.0524 | 0.18 | µg/L | NM HH OO |
| 205-99-2 | Benzo(b)fluoranthene | 0.0168 | 0.0524 | 0.18 | µg/L | NM HH OO |
| 53-70-3 | Dibenz(a,h)anthracene | 0.0168 | 0.0524 | 0.034 | µg/L | EPA Regional Tap |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0168 | 0.0524 | 0.18 | µg/L | NM HH OO |
| 87-86-5 | Pentachlorophenol | 0.0523 | 0.261 | 1 | µg/L | EPA MCL |
| **Volatile Organic Compounds** | | | | | | |
| 96-12-8 | Dibromo-3-chloropropane[1,2-] | 0.00596 | 0.0199 | 0.2 | µg/L | EPA MCL |
| 106-93-4 | Dibromoethane[1,2-] | 0.00596 | 0.0199 | 0.05 | µg/L | EPA MCL |
| 126-98-7 | Methacrylonitrile | 1.05 | 5.0 | 1.9 | µg/L | EPA Regional Tap |

Note: This table is applicable to samples reported in this PMR and collected before 9/29/14.

[a] CAS = Chemical Abstracts Service.

[b] PQL = Practical quantitation limit.

[c] NM HH OO = Human health organism only, New Mexico surface-water standards.

**Table 3.4-4**
**Analytes with MDLs above Screening Levels (White Rock Canyon Samples)**

| CAS[a] No. | Analyte Name | MDL | PQL[b] | Screening Level | Unit | Screening-Level Type | Analytical Method | Analytical Lab |
|---|---|---|---|---|---|---|---|---|
| **Semivolatile Organic Compounds** | | | | | | | | |
| 92-87-5 | Benzidine | 3.75 | 9.61 | 0.0011 | µg/L | EPA Regional Tap | SW-846:8270D | GELC[c] |
| 111-44-4 | Bis(2-chloroethyl)ether | 0.63 | 5.23 | 0.14 | µg/L | EPA Regional Tap | SW-846:8270D | SHEALY[d] |
| 91-94-1 | Dichlorobenzidine[3,3'-] | 2.88 | 9.61 | 0.28 | µg/L | NM HH OO[e] | SW-846:8270D | GELC |
| 534-52-1 | Dinitro-2-methylphenol[4,6-] | 1.57 | 26.04 | 1.5 | µg/L | EPA Regional Tap | SW-846:8270D | SHEALY |
| 118-74-1 | Hexachlorobenzene | 0.52 | 5.23 | 0.0029 | µg/L | NM HH OO | SW-846:8270D | SHEALY |
| 55-18-5 | Nitrosodiethylamine[N-] | 2.88 | 9.61 | 0.0017 | µg/L | EPA Regional Tap | SW-846:8270D | GELC |
| 62-75-9 | Nitrosodimethylamine[N-] | 0.73 | 5.23 | 0.0049 | µg/L | EPA Regional Tap | SW-846:8270D | SHEALY |
| 924-16-3 | Nitroso-di-n-butylamine[N-] | 1.46 | 5.23 | 0.027 | µg/L | EPA Regional Tap | SW-846:8270D | SHEALY |
| 621-64-7 | Nitroso-di-n-propylamine[N-] | 0.42 | 5.23 | 0.11 | µg/L | EPA Regional Tap | SW-846:8270D | SHEALY |
| 930-55-2 | Nitrosopyrrolidine[N-] | 2.19 | 5.23 | 0.37 | µg/L | EPA Regional Tap | SW-846:8270D | SHEALY |
| **Volatile Organic Compounds** | | | | | | | | |
| 107-02-8 | Acrolein | 1.50 | 5.00 | 0.042 | µg/L | EPA Regional Tap | SW-846:8260B | GELC |
| 107-13-1 | Acrylonitrile | 1.03 | 5.00 | 0.52 | µg/L | EPA Regional Tap | SW-846:8260B | GELC |
| 126-99-8 | Chloro-1,3-butadiene[2-] | 0.21 | 1.00 | 0.19 | µg/L | EPA Regional Tap | SW-846:8260B | GELC |
| 96-18-4 | Trichloropropane[1,2,3-] | 0.30 | 1.00 | 0.0075 | µg/L | EPA Regional Tap | SW-846:8260B | GELC |

Note: This table is applicable to samples reported in this PMR and collected on or after 9/29/14.

[a] CAS = Chemical Abstracts Service.

[b] PQL = Practical quantitation limit.

[c] GELC = General Engineering Laboratories, Inc., Charleston, SC.

[d] SHEALY = Shealy Environmental Services, Inc.

[e] NM HH OO = Human health organism only, New Mexico surface-water standards.

**Table 3.4-5**
**Analytes with MDLs Now below Screening Levels (White Rock Canyon Samples)**

| CAS[a] No. | Analyte Name | MDL | PQL[b] | Screening Level | Unit | Screening-Level Type | Analytical Method | Analytical Lab |
|---|---|---|---|---|---|---|---|---|
| **Semivolatile Organic Compounds** | | | | | | | | |
| 103-33-3 | Azobenzene | 0.73 | 5.23 | 1.2 | µg/L | EPA Regional Tap | SW-846:8270D | SHEALY[c] |
| 56-55-3 | Benzo(a)anthracene | 0.02 | 0.05 | 0.18 | µg/L | NM HH OO[d] | SW-846:8310 | GELC[e] |
| 50-32-8 | Benzo(a)pyrene | 0.02 | 0.05 | 0.18 | µg/L | NM HH OO | SW-846:8310 | GELC |
| 205-99-2 | Benzo(b)fluoranthene | 0.02 | 0.05 | 0.18 | µg/L | NM HH OO | SW-846:8310 | GELC |
| 53-70-3 | Dibenz(a,h)anthracene | 0.02 | 0.05 | 0.034 | µg/L | EPA Regional Tap | SW-846:8310 | GELC |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.02 | 0.05 | 0.18 | µg/L | NM HH OO | SW-846:8310 | GELC |
| 87-86-5 | Pentachlorophenol | 0.08 | 0.24 | 1 | µg/L | EPA MCL | SW-846:8151A | GELC |
| **Volatile Organic Compounds** | | | | | | | | |
| 96-12-8 | Dibromo-3-Chloropropane[1,2-] | 0.01 | 0.02 | 0.2 | µg/L | EPA MCL | SW-846:8011 | GELC |
| 106-93-4 | Dibromoethane[1,2-] | 0.01 | 0.02 | 0.05 | µg/L | EPA MCL | SW-846:8011 | GELC |
| 126-98-7 | Methacrylonitrile | 1.03 | 5.00 | 1.9 | µg/L | EPA Regional Tap | SW-846:8260B | GELC |

Note: This table is applicable to samples reported in this PMR and collected on or after 9/29/14.

[a] CAS = Chemical Abstracts Service.

[b] PQL = Practical quantitation limit.

[c] SHEALY = Shealy Environmental Services, Inc.

[d] NM HH OO = Human health organism only, New Mexico surface-water standards.

[e] GELC = General Engineering Laboratories, Inc., Charleston, SC.

**Table 4.2-1**
**Sources of Screening Levels for Groundwater and Surface Water at Los Alamos National Laboratory**

| Standard Source | Standard Type | Groundwater | Surface Water |
|---|---|---|---|
| DOE Order 458.1 | DOE BCGs | n/a[a] | X[b] |
| DOE Order 458.1 | DOE 100-mrem Public Dose DCS | X | n/a |
| DOE Order 458.1 | DOE 4-mrem Drinking Water DCS | X | n/a |
| 40 CFR[c] 141 | EPA Primary Drinking Water Standard | X | n/a |
| EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites | EPA Regional Screening Levels for Tap Water | X | n/a |
| 20 NMAC 3.4 | New Mexico Environmental Improvement Board Radiation Protection Standards | X | X |
| 20 NMAC 6.2 | NMWQCC Groundwater Standard | X | n/a |
| 20 NMAC 6.4 | NMWQCC Irrigation Standard | n/a | X |
| 20 NMAC 6.4 | NMWQCC Livestock Watering Standard | n/a | X |
| 20 NMAC 6.4 | NMWQCC Wildlife Habitat Standard | n/a | X |
| 20 NMAC 6.4 | NMWQCC Aquatic Life Standards Acute | n/a | X |
| 20 NMAC 6.4 | NMWQCC Aquatic Life Standards Chronic | n/a | X |
| 20 NMAC 6.4 | NMWQCC Human Health Standard | n/a | X |

[a] n/a = Not applicable.

[b] X = applied to data screen for this report.

[c] CFR = Code of Federal Regulations.

**Table 4.2-2**
**Base-Flow Location Type and Hardness Assignments Used to Select Screening Levels**

| Watershed | Location | Stream Type | Hardness (mg/L as $CaCO_3$) |
|---|---|---|---|
| Los Alamos | LA Canyon near Otowi Bridge | Ephemeral | 100 |
| White Rock | Rio Grande at Otowi Bridge | Perennial | 100 |
| White Rock | Mortandad at Rio Grande | Ephemeral | 100 |

**Table 4.2-3**
**San Ildefonso Pueblo General Surveillance Monitoring Group Groundwater Results above Screening Levels**

| Location | Date | Analyte | Field Prep Code | Result | Unit | Screening Level | Screening-Level Type |
|---|---|---|---|---|---|---|---|
| **Intermediate Groundwater Springs** | | | | | | | |
| Vine Tree Spring | 12/17/13 | Perchlorate | F* | 5.66 | µg/L | 4 | Consent Order |
| Vine Tree Spring | 06/18/14 | Perchlorate | F | 5.89 | µg/L | 4 | Consent Order |
| **Regional Aquifer Springs** | | | | | | | |
| Sacred Spring | 10/30/14 | Manganese | F | 706 | µg/L | 200 | NMWQCC Groundwater Standard |

* F = Filtered.

# Appendix A

*Field Parameter Results, Including Results from Previous Four Monitoring Events if Available*

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| La Mesita Spring | —[a] | 10/29/14 | WG[b] | Dissolved Oxygen | 8.34 | mg/L | CAWR-14-89228 |
| La Mesita Spring | — | 10/06/14 | WG | Dissolved Oxygen | 8.13 | mg/L | CAWR-14-86935 |
| La Mesita Spring | — | 12/17/13 | WG | Dissolved Oxygen | 8.16 | mg/L | CAWR-13-42145 |
| La Mesita Spring | — | 10/02/12 | WG | Dissolved Oxygen | 8.11 | mg/L | CAWR-12-23429 |
| La Mesita Spring | — | 10/12/11 | WG | Dissolved Oxygen | 8.29 | mg/L | CAWR-11-27992 |
| La Mesita Spring | — | 10/07/10 | WG | Dissolved Oxygen | 7.47 | mg/L | CAWR-10-25330 |
| La Mesita Spring | — | 10/29/14 | WG | Flow (in gpm[c]) | 0.17 | gpm | CAWR-14-89228 |
| La Mesita Spring | — | 10/06/14 | WG | Flow (in gpm) | 0.4 | gpm | CAWR-14-86935 |
| La Mesita Spring | — | 10/07/10 | WG | Flow (in gpm) | 0.18 | gpm | CAWR-10-25330 |
| La Mesita Spring | — | 09/22/09 | WG | Flow (in gpm) | 0.2 | gpm | CAWR-09-12480 |
| La Mesita Spring | — | 10/29/14 | WG | pH | 7.69 | SU[d] | CAWR-14-89228 |
| La Mesita Spring | — | 10/06/14 | WG | pH | 7.89 | SU | CAWR-14-86935 |
| La Mesita Spring | — | 12/17/13 | WG | pH | 7.96 | SU | CAWR-13-42145 |
| La Mesita Spring | — | 10/02/12 | WG | pH | 7.81 | SU | CAWR-12-23429 |
| La Mesita Spring | — | 10/12/11 | WG | pH | 8.09 | SU | CAWR-11-27992 |
| La Mesita Spring | — | 10/07/10 | WG | pH | 7.55 | SU | CAWR-10-25330 |
| La Mesita Spring | — | 10/29/14 | WG | Specific Conductance | 318 | µS/cm | CAWR-14-89228 |
| La Mesita Spring | — | 10/06/14 | WG | Specific Conductance | 316 | µS/cm | CAWR-14-86935 |
| La Mesita Spring | — | 12/17/13 | WG | Specific Conductance | 319 | µS/cm | CAWR-13-42145 |
| La Mesita Spring | — | 10/02/12 | WG | Specific Conductance | 309 | µS/cm | CAWR-12-23429 |
| La Mesita Spring | — | 10/12/11 | WG | Specific Conductance | 311 | µS/cm | CAWR-11-27992 |
| La Mesita Spring | — | 10/07/10 | WG | Specific Conductance | 314 | µS/cm | CAWR-10-25330 |
| La Mesita Spring | — | 10/29/14 | WG | Temperature | 14.99 | deg C | CAWR-14-89228 |
| La Mesita Spring | — | 10/06/14 | WG | Temperature | 14.8 | deg C | CAWR-14-86935 |
| La Mesita Spring | — | 12/17/13 | WG | Temperature | 14.28 | deg C | CAWR-13-42145 |
| La Mesita Spring | — | 10/02/12 | WG | Temperature | 14.66 | deg C | CAWR-12-23429 |
| La Mesita Spring | — | 10/12/11 | WG | Temperature | 14.33 | deg C | CAWR-11-27992 |
| La Mesita Spring | — | 10/07/10 | WG | Temperature | 14c.56 | deg C | CAWR-10-25330 |

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| La Mesita Spring | — | 10/29/14 | WG | Turbidity | 7.2 | NTU[e] | CAWR-14-89228 |
| La Mesita Spring | — | 10/06/14 | WG | Turbidity | 5.1 | NTU | CAWR-14-86935 |
| La Mesita Spring | — | 12/17/13 | WG | Turbidity | 2.8 | NTU | CAWR-13-42145 |
| La Mesita Spring | — | 10/02/12 | WG | Turbidity | 16.2 | NTU | CAWR-12-23429 |
| La Mesita Spring | — | 10/12/11 | WG | Turbidity | 5.46 | NTU | CAWR-11-27992 |
| La Mesita Spring | — | 10/07/10 | WG | Turbidity | 66.8 | NTU | CAWR-10-25330 |
| Rio Grande at Otowi Bridge | — | 10/30/14 | WS[f] | Dissolved Oxygen | 9.22 | mg/L | CAWR-14-89237 |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | Dissolved Oxygen | 8.75 | mg/L | CAWR-14-86939 |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | Dissolved Oxygen | 12.01 | mg/L | CAWR-13-42146 |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | Dissolved Oxygen | 9.25 | mg/L | CAWR-12-23433 |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | Dissolved Oxygen | 8.74 | mg/L | CAWR-10-25403 |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | Dissolved Oxygen | 7.61 | mg/L | CAWR-10-24226 |
| Rio Grande at Otowi Bridge | — | 10/30/14 | WS | Flow (in gpm) | 268850 | gpm | CAWR-14-89237 |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | Flow (in gpm) | 291740 | gpm | CAWR-14-86939 |
| Rio Grande at Otowi Bridge | — | 01/26/10 | WS | Flow (in gpm) | 3123.65 | gpm | CAWR-10-11786 |
| Rio Grande at Otowi Bridge | — | 09/22/09 | WS | Flow (in gpm) | 210950 | gpm | CAWR-09-12946 |
| Rio Grande at Otowi Bridge | — | 10/30/14 | WS | pH | 8.18 | SU | CAWR-14-89237 |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | pH | 8.27 | SU | CAWR-14-86939 |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | pH | 8.18 | SU | CAWR-13-42146 |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | pH | 8.48 | SU | CAWR-12-23433 |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | pH | 8 | SU | CAWR-10-25403 |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | pH | 7.65 | SU | CAWR-10-24226 |
| Rio Grande at Otowi Bridge | — | 10/30/14 | WS | Specific Conductance | 286 | µS/cm | CAWR-14-89237 |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | Specific Conductance | 325 | µS/cm | CAWR-14-86939 |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | Specific Conductance | 331 | µS/cm | CAWR-13-42146 |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | Specific Conductance | 217 | µS/cm | CAWR-12-23433 |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | Specific Conductance | 335 | µS/cm | CAWR-10-25403 |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | Specific Conductance | 298 | µS/cm | CAWR-10-24226 |

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | — | 10/30/14 | WS | Temperature | 13.43 | deg C | CAWR-14-89237 |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | Temperature | 13.8 | deg C | CAWR-14-86939 |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | Temperature | 0.34 | deg C | CAWR-13-42146 |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | Temperature | 16.29 | deg C | CAWR-12-23433 |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | Temperature | 16.45 | deg C | CAWR-10-25403 |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | Temperature | 19.26 | deg C | CAWR-10-24226 |
| Rio Grande at Otowi Bridge | — | 10/30/14 | WS | Turbidity | 32.4 | NTU | CAWR-14-89237 |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | Turbidity | 79.8 | NTU | CAWR-14-86939 |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | Turbidity | 43.1 | NTU | CAWR-13-42146 |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | Turbidity | 39 | NTU | CAWR-12-23433 |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | Turbidity | 24.8 | NTU | CAWR-10-25403 |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | Turbidity | 45.7 | NTU | CAWR-10-24226 |
| Sacred Spring | — | 10/30/14 | WG | Dissolved Oxygen | 3.7 | mg/L | CAWR-14-89229 |
| Sacred Spring | — | 12/12/13 | WG | Dissolved Oxygen | 2.18 | mg/L | CAWR-13-42147 |
| Sacred Spring | — | 10/03/12 | WG | Dissolved Oxygen | 5.65 | mg/L | CAWR-12-23434 |
| Sacred Spring | — | 10/14/11 | WG | Dissolved Oxygen | 4.06 | mg/L | CAWR-11-27994 |
| Sacred Spring | — | 10/06/10 | WG | Dissolved Oxygen | 1.04 | mg/L | CAWR-10-25332 |
| Sacred Spring | — | 10/30/14 | WG | Flow (in gpm) | 4.49 | gpm | CAWR-14-89229 |
| Sacred Spring | — | 10/06/10 | WG | Flow (in gpm) | 0.24 | gpm | CAWR-10-25332 |
| Sacred Spring | — | 09/22/09 | WG | Flow (in gpm) | 0.38 | gpm | CAWR-09-12471 |
| Sacred Spring | — | 09/26/08 | WG | Flow (in gpm) | 0.25 | gpm | CAWR-08-15456 |
| Sacred Spring | — | 10/30/14 | WG | pH | 7.33 | SU | CAWR-14-89229 |
| Sacred Spring | — | 12/12/13 | WG | pH | 6.85 | SU | CAWR-13-42147 |
| Sacred Spring | — | 10/03/12 | WG | pH | 7.22 | SU | CAWR-12-23434 |
| Sacred Spring | — | 10/14/11 | WG | pH | 7.64 | SU | CAWR-11-27994 |
| Sacred Spring | — | 10/06/10 | WG | pH | 6.6 | SU | CAWR-10-25332 |
| Sacred Spring | — | 10/30/14 | WG | Specific Conductance | 365 | µS/cm | CAWR-14-89229 |
| Sacred Spring | — | 12/12/13 | WG | Specific Conductance | 527 | µS/cm | CAWR-13-42147 |

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| Sacred Spring | — | 10/03/12 | WG | Specific Conductance | 275 | µS/cm | CAWR-12-23434 |
| Sacred Spring | — | 10/14/11 | WG | Specific Conductance | 295 | µS/cm | CAWR-11-27994 |
| Sacred Spring | — | 10/06/10 | WG | Specific Conductance | 266 | µS/cm | CAWR-10-25332 |
| Sacred Spring | — | 10/30/14 | WG | Temperature | 12.94 | deg C | CAWR-14-89229 |
| Sacred Spring | — | 12/12/13 | WG | Temperature | 6.15 | deg C | CAWR-13-42147 |
| Sacred Spring | — | 10/03/12 | WG | Temperature | 15.89 | deg C | CAWR-12-23434 |
| Sacred Spring | — | 10/14/11 | WG | Temperature | 15.34 | deg C | CAWR-11-27994 |
| Sacred Spring | — | 10/06/10 | WG | Temperature | 14.67 | deg C | CAWR-10-25332 |
| Sacred Spring | — | 10/30/14 | WG | Turbidity | 10.9 | NTU | CAWR-14-89229 |
| Sacred Spring | — | 12/12/13 | WG | Turbidity | 2.2 | NTU | CAWR-13-42147 |
| Sacred Spring | — | 10/03/12 | WG | Turbidity | 0.78 | NTU | CAWR-12-23434 |
| Sacred Spring | — | 10/14/11 | WG | Turbidity | 8.44 | NTU | CAWR-11-27994 |
| Sacred Spring | — | 10/06/10 | WG | Turbidity | 6.72 | NTU | CAWR-10-25332 |
| Spring 1 | — | 09/29/14 | WG | Dissolved Oxygen | 6.18 | mg/L | CAWR-14-86942 |
| Spring 1 | — | 12/11/13 | WG | Dissolved Oxygen | 5.73 | mg/L | CAWR-13-42149 |
| Spring 1 | — | 09/24/12 | WG | Dissolved Oxygen | 6.5 | mg/L | CAWR-12-23436 |
| Spring 1 | — | 10/11/11 | WG | Dissolved Oxygen | 6.42 | mg/L | CAWR-11-27999 |
| Spring 1 | — | 09/27/10 | WG | Dissolved Oxygen | 6.46 | mg/L | CAWR-10-25418 |
| Spring 1 | — | 09/29/14 | WG | Flow (in gpm) | 3.14 | gpm | CAWR-14-86942 |
| Spring 1 | — | 10/11/11 | WG | Flow (in gpm) | 0.31 | gpm | CAWR-11-27999 |
| Spring 1 | — | 09/27/10 | WG | Flow (in gpm) | 1.55 | gpm | CAWR-10-25418 |
| Spring 1 | — | 09/28/09 | WG | Flow (in gpm) | 0.54 | gpm | CAWR-09-12484 |
| Spring 1 | — | 09/29/08 | WG | Flow (in gpm) | 1 | gpm | CAWR-08-15472 |
| Spring 1 | — | 09/29/14 | WG | Oxidation-Reduction Potential | 183.3 | mV | CAWR-14-86942 |
| Spring 1 | — | 09/26/05 | WG | Oxidation-Reduction Potential | -999 | mV | FU05090G1SW01 |
| Spring 1 | — | 09/29/14 | WG | pH | 7.78 | SU | CAWR-14-86942 |
| Spring 1 | — | 12/11/13 | WG | pH | 7.9 | SU | CAWR-13-42149 |
| Spring 1 | — | 09/24/12 | WG | pH | 7.78 | SU | CAWR-12-23436 |

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| Spring 1 | — | 10/11/11 | WG | pH | 8.01 | SU | CAWR-11-27999 |
| Spring 1 | — | 09/27/10 | WG | pH | 7.64 | SU | CAWR-10-25418 |
| Spring 1 | — | 09/29/14 | WG | Specific Conductance | 216 | µS/cm | CAWR-14-86942 |
| Spring 1 | — | 12/11/13 | WG | Specific Conductance | 214 | µS/cm | CAWR-13-42149 |
| Spring 1 | — | 09/24/12 | WG | Specific Conductance | 214 | µS/cm | CAWR-12-23436 |
| Spring 1 | — | 10/11/11 | WG | Specific Conductance | 215 | µS/cm | CAWR-11-27999 |
| Spring 1 | — | 09/27/10 | WG | Specific Conductance | 217 | µS/cm | CAWR-10-25418 |
| Spring 1 | — | 09/29/14 | WG | Temperature | 18.94 | deg C | CAWR-14-86942 |
| Spring 1 | — | 12/11/13 | WG | Temperature | 15.45 | deg C | CAWR-13-42149 |
| Spring 1 | — | 09/24/12 | WG | Temperature | 18.87 | deg C | CAWR-12-23436 |
| Spring 1 | — | 10/11/11 | WG | Temperature | 17.88 | deg C | CAWR-11-27999 |
| Spring 1 | — | 09/27/10 | WG | Temperature | 18.09 | deg C | CAWR-10-25418 |
| Spring 1 | — | 09/29/14 | WG | Turbidity | 3.5 | NTU | CAWR-14-86942 |
| Spring 1 | — | 12/11/13 | WG | Turbidity | 4.8 | NTU | CAWR-13-42149 |
| Spring 1 | — | 09/24/12 | WG | Turbidity | 1.95 | NTU | CAWR-12-23436 |
| Spring 1 | — | 10/11/11 | WG | Turbidity | 3.25 | NTU | CAWR-11-27999 |
| Spring 1 | — | 09/27/10 | WG | Turbidity | 6.16 | NTU | CAWR-10-25418 |
| Spring 2 | — | 10/29/14 | WG | Dissolved Oxygen | 8.35 | mg/L | CAWR-14-89231 |
| Spring 2 | — | 09/29/14 | WG | Dissolved Oxygen | 6.32 | mg/L | CAWR-14-87098 |
| Spring 2 | — | 09/24/12 | WG | Dissolved Oxygen | 7.09 | mg/L | CAWR-12-23437 |
| Spring 2 | — | 10/11/11 | WG | Dissolved Oxygen | 8.08 | mg/L | CAWR-11-28002 |
| Spring 2 | — | 09/27/10 | WG | Dissolved Oxygen | 7.59 | mg/L | CAWR-10-25422 |
| Spring 2 | — | 09/28/09 | WG | Dissolved Oxygen | 7.4 | mg/L | CAWR-09-12490 |
| Spring 2 | — | 10/29/14 | WG | Flow (in gpm) | 0.4 | gpm | CAWR-14-89231 |
| Spring 2 | — | 09/29/14 | WG | Flow (in gpm) | 0.17 | gpm | CAWR-14-87098 |
| Spring 2 | — | 10/11/11 | WG | Flow (in gpm) | 0.16 | gpm | CAWR-11-28002 |
| Spring 2 | — | 09/27/10 | WG | Flow (in gpm) | 0.4 | gpm | CAWR-10-25422 |
| Spring 2 | — | 09/28/09 | WG | Flow (in gpm) | 0.21 | gpm | CAWR-09-12490 |

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| Spring 2 | — | 09/29/08 | WG | Flow (in gpm) | 0.1 | gpm | CAWR-08-15475 |
| Spring 2 | — | 10/29/14 | WG | pH | 7.53 | SU | CAWR-14-89231 |
| Spring 2 | — | 09/29/14 | WG | pH | 7.96 | SU | CAWR-14-87098 |
| Spring 2 | — | 09/24/12 | WG | pH | 7.93 | SU | CAWR-12-23437 |
| Spring 2 | — | 10/11/11 | WG | pH | 8.3 | SU | CAWR-11-28002 |
| Spring 2 | — | 09/27/10 | WG | pH | 7.52 | SU | CAWR-10-25422 |
| Spring 2 | — | 09/28/09 | WG | pH | 7.06 | SU | CAWR-09-12490 |
| Spring 2 | — | 10/29/14 | WG | Specific Conductance | 238 | µS/cm | CAWR-14-89231 |
| Spring 2 | — | 09/29/14 | WG | Specific Conductance | 192 | µS/cm | CAWR-14-87098 |
| Spring 2 | — | 09/24/12 | WG | Specific Conductance | 247 | µS/cm | CAWR-12-23437 |
| Spring 2 | — | 10/11/11 | WG | Specific Conductance | 260 | µS/cm | CAWR-11-28002 |
| Spring 2 | — | 09/27/10 | WG | Specific Conductance | 261 | µS/cm | CAWR-10-25422 |
| Spring 2 | — | 09/28/09 | WG | Specific Conductance | 226 | µS/cm | CAWR-09-12490 |
| Spring 2 | — | 10/29/14 | WG | Temperature | 12.65 | deg C | CAWR-14-89231 |
| Spring 2 | — | 09/29/14 | WG | Temperature | 17.76 | deg C | CAWR-14-87098 |
| Spring 2 | — | 09/24/12 | WG | Temperature | 17.73 | deg C | CAWR-12-23437 |
| Spring 2 | — | 10/11/11 | WG | Temperature | 14.6 | deg C | CAWR-11-28002 |
| Spring 2 | — | 09/27/10 | WG | Temperature | 16.81 | deg C | CAWR-10-25422 |
| Spring 2 | — | 09/28/09 | WG | Temperature | 13.6 | deg C | CAWR-09-12490 |
| Spring 2 | — | 10/29/14 | WG | Turbidity | 27.7 | NTU | CAWR-14-89231 |
| Spring 2 | — | 09/29/14 | WG | Turbidity | 13.4 | NTU | CAWR-14-87098 |
| Spring 2 | — | 09/24/12 | WG | Turbidity | 1.57 | NTU | CAWR-12-23437 |
| Spring 2 | — | 10/11/11 | WG | Turbidity | 1.81 | NTU | CAWR-11-28002 |
| Spring 2 | — | 09/27/10 | WG | Turbidity | 2.06 | NTU | CAWR-10-25422 |
| Spring 2 | — | 09/28/09 | WG | Turbidity | 13.1 | NTU | CAWR-09-12490 |
| LLAO-4 | 5.24 | 06/17/14 | WG | Dissolved Oxygen | 1.34 | mg/L | CALA-14-79458 |
| LLAO-4 | 5.24 | 06/12/13 | WG | Dissolved Oxygen | 3.78 | mg/L | CALA-13-33423 |
| LLAO-4 | 5.24 | 04/09/12 | WG | Dissolved Oxygen | 3.91 | mg/L | CALA-12-12549 |

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| LLAO-4 | 5.24 | 08/11/11 | WG | Dissolved Oxygen | 4.7 | mg/L | CALA-11-25901 |
| LLAO-4 | 5.24 | 06/21/11 | WG | Dissolved Oxygen | 4.2 | mg/L | CALA-11-14674 |
| LLAO-4 | 5.24 | 06/17/14 | WG | Flow (in gpm) | 0.24 | gpm | CALA-14-79458 |
| LLAO-4 | 5.24 | 08/11/11 | WG | Flow (in gpm) | 0.24 | gpm | CALA-11-25901 |
| LLAO-4 | 5.24 | 06/21/11 | WG | Flow (in gpm) | 0.22 | gpm | CALA-11-14674 |
| LLAO-4 | 5.24 | 08/26/10 | WG | Flow (in gpm) | 0.24 | gpm | CALA-10-25247 |
| LLAO-4 | 5.24 | 07/08/09 | WG | Flow (in gpm) | 0.26 | gpm | CALA-09-11202 |
| LLAO-4 | 5.24 | 06/17/14 | WG | Oxidation-Reduction Potential | 70 | mV | CALA-14-79458 |
| LLAO-4 | 5.24 | 06/12/13 | WG | Oxidation-Reduction Potential | 151.9 | mV | CALA-13-33423 |
| LLAO-4 | 5.24 | 04/09/12 | WG | Oxidation-Reduction Potential | 12.2 | mV | CALA-12-12549 |
| LLAO-4 | 5.24 | 08/11/11 | WG | Oxidation-Reduction Potential | 212.6 | mV | CALA-11-25901 |
| LLAO-4 | 5.24 | 06/21/11 | WG | Oxidation-Reduction Potential | 217.6 | mV | CALA-11-14674 |
| LLAO-4 | 5.24 | 06/17/14 | WG | pH | 6.67 | SU | CALA-14-79458 |
| LLAO-4 | 5.24 | 06/12/13 | WG | pH | 6.93 | SU | CALA-13-33423 |
| LLAO-4 | 5.24 | 04/09/12 | WG | pH | 6.93 | SU | CALA-12-12549 |
| LLAO-4 | 5.24 | 08/11/11 | WG | pH | 6.87 | SU | CALA-11-25901 |
| LLAO-4 | 5.24 | 06/21/11 | WG | pH | 6.89 | SU | CALA-11-14674 |
| LLAO-4 | 5.24 | 06/17/14 | WG | Specific Conductance | 572 | µS/cm | CALA-14-79458 |
| LLAO-4 | 5.24 | 06/12/13 | WG | Specific Conductance | 399 | µS/cm | CALA-13-33423 |
| LLAO-4 | 5.24 | 04/09/12 | WG | Specific Conductance | 464 | µS/cm | CALA-12-12549 |
| LLAO-4 | 5.24 | 08/11/11 | WG | Specific Conductance | 466 | µS/cm | CALA-11-25901 |
| LLAO-4 | 5.24 | 06/21/11 | WG | Specific Conductance | 468 | µS/cm | CALA-11-14674 |
| LLAO-4 | 5.24 | 06/17/14 | WG | Temperature | 13.76 | deg C | CALA-14-79458 |
| LLAO-4 | 5.24 | 06/12/13 | WG | Temperature | 14.03 | deg C | CALA-13-33423 |
| LLAO-4 | 5.24 | 04/09/12 | WG | Temperature | 11.87 | deg C | CALA-12-12549 |
| LLAO-4 | 5.24 | 08/11/11 | WG | Temperature | 15.92 | deg C | CALA-11-25901 |
| LLAO-4 | 5.24 | 06/21/11 | WG | Temperature | 14 | deg C | CALA-11-14674 |
| LLAO-4 | 5.24 | 06/17/14 | WG | Turbidity | 0.3 | NTU | CALA-14-79458 |

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| LLAO-4 | 5.24 | 06/12/13 | WG | Turbidity | 0.7 | NTU | CALA-13-33423 |
| LLAO-4 | 5.24 | 04/09/12 | WG | Turbidity | 0.24 | NTU | CALA-12-12549 |
| LLAO-4 | 5.24 | 08/11/11 | WG | Turbidity | 0.21 | NTU | CALA-11-25901 |
| LLAO-4 | 5.24 | 06/21/11 | WG | Turbidity | 0.17 | NTU | CALA-11-14674 |
| Vine Tree Spring | — | 06/18/14 | WG | Dissolved Oxygen | 7.55 | mg/L | CALA-14-79460 |
| Vine Tree Spring | — | 12/17/13 | WG | Dissolved Oxygen | 7.97 | mg/L | CALA-14-46053 |
| Vine Tree Spring | — | 06/11/13 | WG | Dissolved Oxygen | 6.99 | mg/L | CALA-13-33427 |
| Vine Tree Spring | — | 12/12/12 | WG | Dissolved Oxygen | 7.54 | mg/L | CALA-13-24549 |
| Vine Tree Spring | — | 04/10/12 | WG | Dissolved Oxygen | 6.75 | mg/L | CALA-12-12546 |
| Vine Tree Spring | — | 06/18/14 | WG | Flow (in gpm) | 7.6 | gpm | CALA-14-79460 |
| Vine Tree Spring | — | 12/12/11 | WG | Flow (in gpm) | 20 | gpm | CAWR-12-1756 |
| Vine Tree Spring | — | 08/08/11 | WG | Flow (in gpm) | 20 | gpm | CAWR-11-23212 |
| Vine Tree Spring | — | 06/18/14 | WG | pH | 7.96 | SU | CALA-14-79460 |
| Vine Tree Spring | — | 12/17/13 | WG | pH | 7.04 | SU | CALA-14-46053 |
| Vine Tree Spring | — | 06/11/13 | WG | pH | 7.71 | SU | CALA-13-33427 |
| Vine Tree Spring | — | 12/12/12 | WG | pH | 7.16 | SU | CALA-13-24549 |
| Vine Tree Spring | — | 04/10/12 | WG | pH | 7.16 | SU | CALA-12-12546 |
| Vine Tree Spring | — | 06/18/14 | WG | Specific Conductance | 295 | µS/cm | CALA-14-79460 |
| Vine Tree Spring | — | 12/17/13 | WG | Specific Conductance | 296 | µS/cm | CALA-14-46053 |
| Vine Tree Spring | — | 06/11/13 | WG | Specific Conductance | 311 | µS/cm | CALA-13-33427 |
| Vine Tree Spring | — | 12/12/12 | WG | Specific Conductance | 300 | µS/cm | CALA-13-24549 |
| Vine Tree Spring | — | 04/10/12 | WG | Specific Conductance | 312 | µS/cm | CALA-12-12546 |
| Vine Tree Spring | — | 06/18/14 | WG | Temperature | 14.26 | deg C | CALA-14-79460 |
| Vine Tree Spring | — | 12/17/13 | WG | Temperature | 11.83 | deg C | CALA-14-46053 |
| Vine Tree Spring | — | 06/11/13 | WG | Temperature | 14.2 | deg C | CALA-13-33427 |
| Vine Tree Spring | — | 12/12/12 | WG | Temperature | 11.29 | deg C | CALA-13-24549 |
| Vine Tree Spring | — | 04/10/12 | WG | Temperature | 14.1 | deg C | CALA-12-12546 |
| Vine Tree Spring | — | 06/18/14 | WG | Turbidity | 2.6 | NTU | CALA-14-79460 |

| Location | Depth (ft) | Date | Field Matrix | Analyte | Result | Unit | Sample |
|---|---|---|---|---|---|---|---|
| Vine Tree Spring | — | 12/17/13 | WG | Turbidity | 2.2 | NTU | CALA-14-46053 |
| Vine Tree Spring | — | 06/11/13 | WG | Turbidity | 0.7 | NTU | CALA-13-33427 |
| Vine Tree Spring | — | 12/12/12 | WG | Turbidity | 0.59 | NTU | CALA-13-24549 |
| Vine Tree Spring | — | 04/10/12 | WG | Turbidity | 1.03 | NTU | CALA-12-12546 |

[a] — = Not applicable.

[b] WG = Groundwater.

[c] gpm = Gallons per minute.

[d] SU = Standard unit.

[e] NTU = Nephelometric turbidity unit.

[f] WS = Base flow.

# Appendix B

*Groundwater-Elevation Measurements*
*(on CD included with this document)*

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-1b | 06/11/14 | 5827.7 | Manual | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 03/12/14 | 5827.86 | Manual | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/13/13 | 5827.9 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/12/13 | 5827.91 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/11/13 | 5827.92 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/10/13 | 5827.92 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/09/13 | 5827.94 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/08/13 | 5827.96 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/07/13 | 5828 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/06/13 | 5828.02 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/05/13 | 5828.02 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/04/13 | 5828.02 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/03/13 | 5828.07 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/02/13 | 5828.18 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 12/01/13 | 5828.35 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/30/13 | 5828.55 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/29/13 | 5828.79 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/28/13 | 5829.05 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/27/13 | 5829.25 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/26/13 | 5829.51 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/25/13 | 5830.05 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/24/13 | 5830.42 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/23/13 | 5831.09 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/22/13 | 5832.07 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/21/13 | 5833.1 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/20/13 | 5833.95 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/19/13 | 5834.39 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/18/13 | 5834.74 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/17/13 | 5835.35 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/16/13 | 5835.88 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/15/13 | 5836.29 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/14/13 | 5836.72 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/13/13 | 5837.02 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/12/13 | 5837.38 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/11/13 | 5837.69 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/10/13 | 5837.93 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/09/13 | 5838.21 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/08/13 | 5838.45 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/07/13 | 5838.67 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/06/13 | 5838.92 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/05/13 | 5838.87 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/04/13 | 5839.06 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/03/13 | 5839.31 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/02/13 | 5839.48 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 11/01/13 | 5839.77 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/31/13 | 5840.02 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/30/13 | 5840.28 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/29/13 | 5840.5 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/28/13 | 5840.72 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/27/13 | 5840.85 | Transducer | 11.32 | 21.32 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-1b | 10/26/13 | 5841.05 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/25/13 | 5841.18 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/24/13 | 5841.38 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/23/13 | 5841.53 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/22/13 | 5841.67 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/21/13 | 5841.84 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/20/13 | 5842.01 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/19/13 | 5842.1 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/18/13 | 5842.31 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/17/13 | 5842.41 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/16/13 | 5842.56 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/15/13 | 5842.68 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/14/13 | 5842.85 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/13/13 | 5843.01 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/12/13 | 5842.93 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/11/13 | 5842.82 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/10/13 | 5842.95 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/09/13 | 5843.05 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/08/13 | 5843.15 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/07/13 | 5843.2 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/06/13 | 5843.26 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/05/13 | 5843.36 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/04/13 | 5843.49 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/03/13 | 5843.3 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/02/13 | 5843.36 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 10/01/13 | 5843.43 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/30/13 | 5843.47 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/29/13 | 5843.45 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/28/13 | 5843.38 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/27/13 | 5843.37 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/26/13 | 5843.31 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/25/13 | 5843.26 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/24/13 | 5843.11 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/23/13 | 5842.93 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/22/13 | 5842.65 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/21/13 | 5842.24 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/20/13 | 5841.79 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/19/13 | 5840.99 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/18/13 | 5839.47 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/18/13 | 5840.47 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/18/13 | 5840.43 | Manual | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/17/13 | 5835.93 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/16/13 | 5832.39 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/15/13 | 5830.38 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/14/13 | 5828.48 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/13/13 | 5828.06 | Transducer | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 08/06/13 | 5827.76 | Manual | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 05/30/13 | 5827.65 | Manual | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 02/13/13 | 5827.78 | Manual | 11.32 | 21.32 | Alluvial |
| LLAO-1b | 09/20/12 | 5827.74 | Manual | 11.32 | 21.32 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 09/10/14 | 5507.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/10/14 | 5507.71 | Manual | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/09/14 | 5507.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/08/14 | 5507.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/07/14 | 5507.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/06/14 | 5507.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/05/14 | 5507.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/04/14 | 5507.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/03/14 | 5507.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/02/14 | 5507.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/01/14 | 5507.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/31/14 | 5507.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/30/14 | 5507.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/29/14 | 5507.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/28/14 | 5507.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/27/14 | 5507.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/26/14 | 5507.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/25/14 | 5507.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/24/14 | 5507.89 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/23/14 | 5507.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/22/14 | 5507.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/21/14 | 5507.94 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/20/14 | 5507.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/19/14 | 5507.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/18/14 | 5508 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/17/14 | 5508.02 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/16/14 | 5508.04 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/15/14 | 5508.07 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/14/14 | 5508.09 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/13/14 | 5508.12 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/12/14 | 5508.14 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/11/14 | 5508.16 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/10/14 | 5508.19 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/09/14 | 5508.23 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/08/14 | 5508.25 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/07/14 | 5508.27 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/06/14 | 5508.28 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/05/14 | 5508.27 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/04/14 | 5508.3 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/03/14 | 5508.33 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/02/14 | 5508.31 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/01/14 | 5508.1 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/31/14 | 5508.07 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/30/14 | 5508.07 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/29/14 | 5508.07 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/28/14 | 5508.08 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/27/14 | 5508.11 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/26/14 | 5508.13 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/25/14 | 5508.15 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/24/14 | 5508.16 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 07/23/14 | 5508.18 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/22/14 | 5508.19 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/21/14 | 5508.19 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/20/14 | 5508.19 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/19/14 | 5508.18 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/18/14 | 5508.16 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/17/14 | 5508.1 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/16/14 | 5508.01 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/15/14 | 5508 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/14/14 | 5508.01 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/13/14 | 5508.02 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/12/14 | 5508.03 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/11/14 | 5508.03 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/10/14 | 5508.04 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/09/14 | 5508.05 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/08/14 | 5508.08 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/07/14 | 5508.1 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/06/14 | 5508.13 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/05/14 | 5508.15 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/04/14 | 5508.19 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/03/14 | 5508.22 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/02/14 | 5508.26 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/01/14 | 5508.3 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/30/14 | 5508.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/29/14 | 5508.39 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/28/14 | 5508.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/27/14 | 5508.49 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/26/14 | 5508.54 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/25/14 | 5508.59 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/24/14 | 5508.63 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/23/14 | 5508.68 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/22/14 | 5508.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/21/14 | 5508.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/20/14 | 5508.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/19/14 | 5508.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/18/14 | 5508.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/17/14 | 5508.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/16/14 | 5509.02 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/15/14 | 5509.06 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/14/14 | 5509.11 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/13/14 | 5509.15 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/12/14 | 5509.21 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/11/14 | 5509.21 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/11/14 | 5509.23 | Manual | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/10/14 | 5509.26 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/09/14 | 5509.31 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/08/14 | 5509.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/07/14 | 5509.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/06/14 | 5509.45 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/05/14 | 5509.5 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 06/04/14 | 5509.54 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/03/14 | 5509.58 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/02/14 | 5509.62 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/01/14 | 5509.66 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/31/14 | 5509.7 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/30/14 | 5509.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/29/14 | 5509.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/28/14 | 5509.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/27/14 | 5509.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/26/14 | 5509.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/25/14 | 5509.89 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/24/14 | 5509.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/23/14 | 5509.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/22/14 | 5509.99 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/21/14 | 5510.03 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/20/14 | 5510.06 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/19/14 | 5510.1 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/18/14 | 5510.12 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/17/14 | 5510.15 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/16/14 | 5510.16 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/15/14 | 5510.18 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/14/14 | 5510.2 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/13/14 | 5510.22 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/12/14 | 5510.26 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/11/14 | 5510.29 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/10/14 | 5510.3 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/09/14 | 5510.31 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/08/14 | 5510.34 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/07/14 | 5510.37 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/06/14 | 5510.38 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/05/14 | 5510.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/04/14 | 5510.42 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/03/14 | 5510.43 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/02/14 | 5510.45 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/01/14 | 5510.46 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/30/14 | 5510.48 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/29/14 | 5510.5 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/28/14 | 5510.52 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/27/14 | 5510.54 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/26/14 | 5510.55 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/25/14 | 5510.55 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/24/14 | 5510.57 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/23/14 | 5510.59 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/22/14 | 5510.57 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/21/14 | 5510.58 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/20/14 | 5510.6 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/19/14 | 5510.6 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/18/14 | 5510.61 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/17/14 | 5510.62 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/16/14 | 5510.64 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 04/15/14 | 5510.62 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/14/14 | 5510.64 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/13/14 | 5510.66 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/12/14 | 5510.66 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/11/14 | 5510.66 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/10/14 | 5510.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/09/14 | 5510.66 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/08/14 | 5510.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/07/14 | 5510.68 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/06/14 | 5510.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/05/14 | 5510.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/04/14 | 5510.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/03/14 | 5510.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/02/14 | 5510.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/01/14 | 5510.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/31/14 | 5510.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/30/14 | 5510.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/29/14 | 5510.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/28/14 | 5510.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/27/14 | 5510.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/26/14 | 5510.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/25/14 | 5510.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/24/14 | 5510.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/23/14 | 5510.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/22/14 | 5510.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/21/14 | 5510.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/20/14 | 5510.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/19/14 | 5510.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/18/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/17/14 | 5510.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/16/14 | 5510.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/15/14 | 5510.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/14/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/13/14 | 5510.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/12/14 | 5510.77 | Manual | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/12/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/12/14 | 5510.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/11/14 | 5510.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/10/14 | 5510.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/09/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/08/14 | 5510.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/07/14 | 5510.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/06/14 | 5510.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/05/14 | 5510.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/04/14 | 5510.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/03/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/02/14 | 5510.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/01/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/28/14 | 5510.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/27/14 | 5510.86 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 02/26/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/25/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/24/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/23/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/22/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/21/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/20/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/19/14 | 5510.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/18/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/17/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/16/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/15/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/14/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/13/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/12/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/11/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/10/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/09/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/08/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/07/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/06/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/05/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/04/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/03/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/02/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/01/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/31/14 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/30/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/29/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/28/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/27/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/26/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/25/14 | 5510.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/24/14 | 5510.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/23/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/22/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/21/14 | 5510.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/20/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/19/14 | 5510.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/18/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/17/14 | 5510.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/16/14 | 5510.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/15/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/14/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/13/14 | 5510.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/12/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/11/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/10/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/09/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/08/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 01/07/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/06/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/05/14 | 5510.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/04/14 | 5510.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/03/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/02/14 | 5510.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/01/14 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/31/13 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/30/13 | 5510.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/29/13 | 5510.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/28/13 | 5510.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/27/13 | 5510.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/26/13 | 5510.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/25/13 | 5510.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/24/13 | 5510.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/23/13 | 5510.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/22/13 | 5510.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/21/13 | 5510.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/20/13 | 5510.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/19/13 | 5510.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/18/13 | 5510.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/17/13 | 5510.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/16/13 | 5510.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/15/13 | 5510.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/14/13 | 5510.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/13/13 | 5510.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/12/13 | 5510.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/11/13 | 5510.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/10/13 | 5510.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/09/13 | 5510.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/08/13 | 5510.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/07/13 | 5510.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/06/13 | 5510.7 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/05/13 | 5510.68 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/04/13 | 5510.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/03/13 | 5510.68 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/02/13 | 5510.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/01/13 | 5510.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/30/13 | 5510.66 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/29/13 | 5510.65 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/28/13 | 5510.61 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/27/13 | 5510.6 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/26/13 | 5510.59 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/25/13 | 5510.55 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/24/13 | 5510.55 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/23/13 | 5510.53 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/22/13 | 5510.52 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/21/13 | 5510.49 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/20/13 | 5510.49 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/19/13 | 5510.48 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 11/18/13 | 5510.48 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/17/13 | 5510.46 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/16/13 | 5510.47 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/15/13 | 5510.45 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/14/13 | 5510.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/13/13 | 5510.43 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/12/13 | 5510.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/11/13 | 5510.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/10/13 | 5510.43 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/09/13 | 5510.42 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/08/13 | 5510.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/07/13 | 5510.38 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/06/13 | 5510.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/05/13 | 5510.38 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/04/13 | 5510.37 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/03/13 | 5510.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/02/13 | 5510.37 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/01/13 | 5510.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/31/13 | 5510.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/30/13 | 5510.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/29/13 | 5510.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/28/13 | 5510.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/27/13 | 5510.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/26/13 | 5510.34 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/25/13 | 5510.34 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/24/13 | 5510.33 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/23/13 | 5510.33 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/22/13 | 5510.33 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/21/13 | 5510.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/20/13 | 5510.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/19/13 | 5510.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/18/13 | 5510.38 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/17/13 | 5510.38 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/16/13 | 5510.38 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/15/13 | 5510.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/14/13 | 5510.42 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/13/13 | 5510.42 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/12/13 | 5510.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/11/13 | 5510.46 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/10/13 | 5510.49 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/09/13 | 5510.52 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/08/13 | 5510.55 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/07/13 | 5510.57 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/06/13 | 5510.61 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/05/13 | 5510.66 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/04/13 | 5510.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/03/13 | 5510.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/02/13 | 5510.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/01/13 | 5510.94 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/30/13 | 5511.02 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 09/29/13 | 5511.11 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/28/13 | 5511.24 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/27/13 | 5511.39 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/26/13 | 5511.54 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/25/13 | 5511.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/24/13 | 5511.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/23/13 | 5511.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/22/13 | 5511.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/21/13 | 5512.06 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/20/13 | 5512.22 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/19/13 | 5512.3 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/18/13 | 5512.29 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/18/13 | 5512.18 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/18/13 | 5512.28 | Manual | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/17/13 | 5512.13 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/16/13 | 5511.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/15/13 | 5510.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/14/13 | 5508.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/13/13 | 5506.99 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/12/13 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/11/13 | 5506.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/10/13 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/09/13 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/08/13 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/07/13 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/06/13 | 5506.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/05/13 | 5506.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/04/13 | 5506.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/03/13 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/02/13 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/01/13 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/31/13 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/30/13 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/29/13 | 5506.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/28/13 | 5506.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/27/13 | 5506.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/26/13 | 5506.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/25/13 | 5506.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/24/13 | 5506.89 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/23/13 | 5506.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/22/13 | 5506.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/21/13 | 5506.89 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/20/13 | 5506.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/19/13 | 5506.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/18/13 | 5506.93 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/17/13 | 5506.94 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/16/13 | 5506.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/15/13 | 5506.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/14/13 | 5506.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/13/13 | 5506.98 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 08/12/13 | 5506.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/11/13 | 5506.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/10/13 | 5506.94 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/09/13 | 5506.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/08/13 | 5506.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/07/13 | 5506.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/06/13 | 5506.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/05/13 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/04/13 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/03/13 | 5506.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/02/13 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/01/13 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/31/13 | 5506.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/30/13 | 5506.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/29/13 | 5506.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/28/13 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/27/13 | 5506.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/26/13 | 5506.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/25/13 | 5506.7 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/24/13 | 5506.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/23/13 | 5506.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/22/13 | 5506.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/21/13 | 5506.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/20/13 | 5506.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/19/13 | 5506.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/18/13 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/17/13 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/16/13 | 5506.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/15/13 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/14/13 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/13/13 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/12/13 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/11/13 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/10/13 | 5506.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/09/13 | 5506.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/08/13 | 5506.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/07/13 | 5506.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/06/13 | 5506.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/05/13 | 5506.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/04/13 | 5506.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/03/13 | 5506.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/02/13 | 5506.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/01/13 | 5506.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/30/13 | 5506.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/29/13 | 5507.01 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/28/13 | 5507.02 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/27/13 | 5507.04 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/26/13 | 5507.06 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/25/13 | 5507.08 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/24/13 | 5507.11 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 06/23/13 | 5507.13 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/22/13 | 5507.16 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/21/13 | 5507.18 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/20/13 | 5507.21 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/19/13 | 5507.24 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/18/13 | 5507.28 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/17/13 | 5507.3 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/16/13 | 5507.34 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/15/13 | 5507.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/14/13 | 5507.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/13/13 | 5507.43 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/12/13 | 5507.47 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/11/13 | 5507.49 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/10/13 | 5507.53 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/09/13 | 5507.56 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/08/13 | 5507.58 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/07/13 | 5507.64 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/06/13 | 5507.66 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/05/13 | 5507.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/04/13 | 5507.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/03/13 | 5507.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/02/13 | 5507.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/01/13 | 5507.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/31/13 | 5507.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/30/13 | 5507.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/30/13 | 5507.9 | Manual | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/30/13 | 5507.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/29/13 | 5507.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/28/13 | 5508.01 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/27/13 | 5508.05 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/26/13 | 5508.09 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/25/13 | 5508.14 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/24/13 | 5508.18 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/23/13 | 5508.21 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/22/13 | 5508.25 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/21/13 | 5508.29 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/20/13 | 5508.33 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/19/13 | 5508.37 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/18/13 | 5508.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/17/13 | 5508.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/16/13 | 5508.47 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/15/13 | 5508.5 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/14/13 | 5508.55 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/13/13 | 5508.58 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/12/13 | 5508.61 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/11/13 | 5508.64 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/10/13 | 5508.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/09/13 | 5508.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/08/13 | 5508.68 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/07/13 | 5508.71 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 05/06/13 | 5508.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/05/13 | 5508.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/04/13 | 5508.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/03/13 | 5508.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/02/13 | 5508.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 05/01/13 | 5508.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/30/13 | 5508.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/29/13 | 5508.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/28/13 | 5508.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/27/13 | 5508.89 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/26/13 | 5508.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/25/13 | 5508.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/24/13 | 5508.93 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/23/13 | 5508.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/22/13 | 5508.93 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/21/13 | 5508.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/20/13 | 5508.93 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/19/13 | 5508.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/18/13 | 5508.94 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/17/13 | 5508.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/16/13 | 5508.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/15/13 | 5508.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/14/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/13/13 | 5508.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/12/13 | 5508.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/11/13 | 5508.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/10/13 | 5508.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/09/13 | 5508.99 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/08/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/07/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/06/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/05/13 | 5508.99 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/04/13 | 5509 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/03/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/02/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 04/01/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/31/13 | 5508.99 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/30/13 | 5509.01 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/29/13 | 5509.01 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/28/13 | 5508.99 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/27/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/26/13 | 5509 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/25/13 | 5508.99 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/24/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/23/13 | 5508.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/22/13 | 5508.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/21/13 | 5508.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/20/13 | 5508.99 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/19/13 | 5508.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/18/13 | 5508.95 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 03/17/13 | 5508.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/16/13 | 5508.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/15/13 | 5508.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/14/13 | 5508.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/13/13 | 5508.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/12/13 | 5508.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/11/13 | 5508.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/10/13 | 5508.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/09/13 | 5508.93 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/08/13 | 5508.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/07/13 | 5508.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/06/13 | 5508.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/05/13 | 5508.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/04/13 | 5508.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/03/13 | 5508.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/02/13 | 5508.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 03/01/13 | 5508.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/28/13 | 5508.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/27/13 | 5508.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/26/13 | 5508.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/25/13 | 5508.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/24/13 | 5508.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/23/13 | 5508.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/22/13 | 5508.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/21/13 | 5508.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/20/13 | 5508.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/19/13 | 5508.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/18/13 | 5508.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/17/13 | 5508.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/16/13 | 5508.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/15/13 | 5508.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/14/13 | 5508.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/13/13 | 5508.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/13/13 | 5508.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/13/13 | 5508.8 | Manual | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/12/13 | 5508.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/11/13 | 5508.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/10/13 | 5508.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/09/13 | 5508.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/08/13 | 5508.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/07/13 | 5508.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/06/13 | 5508.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/05/13 | 5508.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/04/13 | 5508.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/03/13 | 5508.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/02/13 | 5508.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 02/01/13 | 5508.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/31/13 | 5508.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/30/13 | 5508.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/29/13 | 5508.72 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 01/28/13 | 5508.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/27/13 | 5508.7 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/26/13 | 5508.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/25/13 | 5508.7 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/24/13 | 5508.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/23/13 | 5508.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/22/13 | 5508.68 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/21/13 | 5508.68 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/20/13 | 5508.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/19/13 | 5508.64 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/18/13 | 5508.64 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/17/13 | 5508.65 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/16/13 | 5508.64 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/15/13 | 5508.6 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/14/13 | 5508.59 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/13/13 | 5508.58 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/12/13 | 5508.57 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/11/13 | 5508.57 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/10/13 | 5508.55 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/09/13 | 5508.57 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/08/13 | 5508.52 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/07/13 | 5508.51 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/06/13 | 5508.53 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/05/13 | 5508.51 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/04/13 | 5508.5 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/03/13 | 5508.5 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/02/13 | 5508.49 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 01/01/13 | 5508.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/31/12 | 5508.43 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/30/12 | 5508.42 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/29/12 | 5508.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/28/12 | 5508.39 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/27/12 | 5508.38 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/26/12 | 5508.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/25/12 | 5508.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/24/12 | 5508.32 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/23/12 | 5508.32 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/22/12 | 5508.3 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/21/12 | 5508.3 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/20/12 | 5508.29 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/19/12 | 5508.25 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/18/12 | 5508.22 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/17/12 | 5508.2 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/16/12 | 5508.18 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/15/12 | 5508.16 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/14/12 | 5508.14 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/13/12 | 5508.13 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/12/12 | 5508.1 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/11/12 | 5508.08 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/10/12 | 5508.07 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 12/09/12 | 5508.04 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/08/12 | 5508.02 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/07/12 | 5508 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/06/12 | 5507.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/05/12 | 5507.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/04/12 | 5507.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/03/12 | 5507.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/02/12 | 5507.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 12/01/12 | 5507.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/30/12 | 5507.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/29/12 | 5507.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/28/12 | 5507.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/27/12 | 5507.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/26/12 | 5507.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/25/12 | 5507.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/24/12 | 5507.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/23/12 | 5507.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/22/12 | 5507.68 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/21/12 | 5507.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/20/12 | 5507.67 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/19/12 | 5507.63 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/18/12 | 5507.59 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/17/12 | 5507.58 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/16/12 | 5507.58 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/15/12 | 5507.54 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/14/12 | 5507.54 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/13/12 | 5507.5 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/12/12 | 5507.51 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/11/12 | 5507.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/10/12 | 5507.42 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/09/12 | 5507.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/08/12 | 5507.38 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/07/12 | 5507.39 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/06/12 | 5507.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/05/12 | 5507.35 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/04/12 | 5507.32 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/03/12 | 5507.28 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/02/12 | 5507.26 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 11/01/12 | 5507.25 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/31/12 | 5507.23 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/30/12 | 5507.21 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/29/12 | 5507.19 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/28/12 | 5507.17 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/27/12 | 5507.17 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/26/12 | 5507.14 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/25/12 | 5507.13 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/24/12 | 5507.11 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/23/12 | 5507.09 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/22/12 | 5507.08 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/21/12 | 5507.07 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 10/20/12 | 5507.05 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/19/12 | 5507.04 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/18/12 | 5507.03 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/17/12 | 5507.01 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/16/12 | 5507 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/15/12 | 5506.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/14/12 | 5506.95 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/13/12 | 5506.93 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/12/12 | 5506.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/11/12 | 5506.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/10/12 | 5506.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/09/12 | 5506.89 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/08/12 | 5506.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/07/12 | 5506.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/06/12 | 5506.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/05/12 | 5506.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/04/12 | 5506.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/03/12 | 5506.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/02/12 | 5506.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 10/01/12 | 5506.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/30/12 | 5506.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/29/12 | 5506.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/28/12 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/27/12 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/26/12 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/25/12 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/24/12 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/23/12 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/22/12 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/21/12 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/20/12 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/20/12 | 5506.77 | Manual | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/19/12 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/18/12 | 5506.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/17/12 | 5506.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/16/12 | 5506.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/15/12 | 5506.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/14/12 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/13/12 | 5506.7 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/12/12 | 5506.69 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/11/12 | 5506.7 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/10/12 | 5506.7 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/09/12 | 5506.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/08/12 | 5506.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/07/12 | 5506.71 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/06/12 | 5506.72 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/05/12 | 5506.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/04/12 | 5506.73 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/03/12 | 5506.74 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 09/02/12 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 09/01/12 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/31/12 | 5506.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/30/12 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/29/12 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/28/12 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/27/12 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/26/12 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/25/12 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/24/12 | 5506.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/23/12 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/22/12 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/21/12 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/20/12 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/19/12 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/18/12 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/17/12 | 5506.75 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/16/12 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/15/12 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/14/12 | 5506.76 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/13/12 | 5506.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/12/12 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/11/12 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/10/12 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/09/12 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/08/12 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/07/12 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/06/12 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/05/12 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/04/12 | 5506.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/03/12 | 5506.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/02/12 | 5506.77 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 08/01/12 | 5506.78 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/31/12 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/30/12 | 5506.79 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/29/12 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/28/12 | 5506.8 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/27/12 | 5506.81 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/26/12 | 5506.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/25/12 | 5506.82 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/24/12 | 5506.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/23/12 | 5506.83 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/22/12 | 5506.84 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/21/12 | 5506.85 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/20/12 | 5506.86 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/19/12 | 5506.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/18/12 | 5506.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/17/12 | 5506.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/16/12 | 5506.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/15/12 | 5506.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/14/12 | 5506.89 | Transducer | 5.24 | 15.24 | Alluvial |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| LLAO-4 | 07/13/12 | 5506.87 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/12/12 | 5506.88 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/11/12 | 5506.89 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/10/12 | 5506.9 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/09/12 | 5506.91 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/08/12 | 5506.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/07/12 | 5506.92 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/06/12 | 5506.93 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/05/12 | 5506.94 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/04/12 | 5506.96 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/03/12 | 5506.97 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/02/12 | 5506.98 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 07/01/12 | 5507 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/30/12 | 5507.02 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/29/12 | 5507.03 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/28/12 | 5507.05 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/27/12 | 5507.07 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/26/12 | 5507.09 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/25/12 | 5507.11 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/24/12 | 5507.12 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/23/12 | 5507.14 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/22/12 | 5507.16 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/21/12 | 5507.18 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/20/12 | 5507.2 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/19/12 | 5507.22 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/18/12 | 5507.25 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/17/12 | 5507.29 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/16/12 | 5507.29 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/15/12 | 5507.32 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/14/12 | 5507.34 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/13/12 | 5507.36 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/12/12 | 5507.4 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/11/12 | 5507.42 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/10/12 | 5507.44 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/09/12 | 5507.47 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/08/12 | 5507.5 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/07/12 | 5507.53 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/06/12 | 5507.56 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/05/12 | 5507.59 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/04/12 | 5507.62 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/03/12 | 5507.65 | Transducer | 5.24 | 15.24 | Alluvial |
| LLAO-4 | 06/02/12 | 5507.69 | Transducer | 5.24 | 15.24 | Alluvial |
| R-10 S1 | 09/08/14 | 5708.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/07/14 | 5708 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/06/14 | 5708.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/05/14 | 5708.15 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/04/14 | 5708.21 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/03/14 | 5708.17 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/02/14 | 5708.16 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/01/14 | 5708.19 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 08/31/14 | 5708.17 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/30/14 | 5708.13 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/29/14 | 5708.11 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/28/14 | 5708.07 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/27/14 | 5708.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/26/14 | 5708.08 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/25/14 | 5708.1 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/24/14 | 5708.09 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/23/14 | 5708.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/22/14 | 5708.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/21/14 | 5708.09 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/20/14 | 5708.12 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/19/14 | 5708.1 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/18/14 | 5708.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/17/14 | 5708.07 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/16/14 | 5708.1 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/15/14 | 5708.11 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/14/14 | 5708.08 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/13/14 | 5708.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/12/14 | 5708.01 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/11/14 | 5708.08 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/10/14 | 5708.17 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/09/14 | 5708.19 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/08/14 | 5708.18 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/07/14 | 5708.19 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/06/14 | 5708.15 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/05/14 | 5708.13 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/04/14 | 5708.08 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/03/14 | 5708.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/02/14 | 5708.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/01/14 | 5707.99 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/31/14 | 5707.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/30/14 | 5707.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/29/14 | 5707.88 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/28/14 | 5707.87 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/27/14 | 5707.9 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/26/14 | 5707.91 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/25/14 | 5707.91 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/24/14 | 5707.89 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/23/14 | 5707.92 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/22/14 | 5707.98 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/21/14 | 5708.01 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/20/14 | 5708.04 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/19/14 | 5708.08 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/18/14 | 5708.08 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/17/14 | 5708.11 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/16/14 | 5708.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/15/14 | 5707.95 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/14/14 | 5707.95 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/13/14 | 5708.01 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 07/12/14 | 5708.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/11/14 | 5708.13 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/10/14 | 5708.16 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/09/14 | 5708.14 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/08/14 | 5708.19 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/07/14 | 5708.16 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/06/14 | 5708.13 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/05/14 | 5708.12 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/04/14 | 5708.15 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/03/14 | 5708.22 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/02/14 | 5708.27 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/01/14 | 5708.31 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/30/14 | 5708.24 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/29/14 | 5708.2 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/28/14 | 5708.24 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/27/14 | 5708.2 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/26/14 | 5708.14 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/25/14 | 5708.12 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/24/14 | 5708.1 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/23/14 | 5708.17 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/22/14 | 5708.17 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/21/14 | 5708.16 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/20/14 | 5708.19 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/19/14 | 5708.24 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/18/14 | 5708.27 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/17/14 | 5708.28 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/16/14 | 5708.31 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/15/14 | 5708.34 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/14/14 | 5708.33 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/13/14 | 5708.28 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/12/14 | 5708.36 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/11/14 | 5708.35 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/10/14 | 5708.31 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/09/14 | 5708.33 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/08/14 | 5708.34 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/07/14 | 5708.37 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/06/14 | 5708.38 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/05/14 | 5708.38 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/04/14 | 5708.39 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/03/14 | 5708.36 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/02/14 | 5708.39 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/01/14 | 5708.41 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/31/14 | 5708.35 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/30/14 | 5708.3 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/29/14 | 5708.29 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/28/14 | 5708.3 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/27/14 | 5708.37 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/26/14 | 5708.44 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/25/14 | 5708.48 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/24/14 | 5708.48 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 05/23/14 | 5708.46 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/22/14 | 5708.49 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/21/14 | 5708.52 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/20/14 | 5708.51 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/19/14 | 5708.48 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/18/14 | 5708.45 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/17/14 | 5708.42 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/16/14 | 5708.33 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/15/14 | 5708.29 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/14/14 | 5708.3 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/13/14 | 5708.48 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/12/14 | 5708.64 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/11/14 | 5708.67 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/10/14 | 5708.6 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/09/14 | 5708.55 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/08/14 | 5708.62 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/07/14 | 5708.63 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/06/14 | 5708.54 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/05/14 | 5708.46 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/04/14 | 5708.44 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/03/14 | 5708.43 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/02/14 | 5708.42 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/01/14 | 5708.47 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/30/14 | 5708.54 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/29/14 | 5708.66 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/28/14 | 5708.77 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/27/14 | 5708.79 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/26/14 | 5708.68 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/25/14 | 5708.59 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/24/14 | 5708.63 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/23/14 | 5708.6 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/22/14 | 5708.46 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/21/14 | 5708.48 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/20/14 | 5708.5 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/19/14 | 5708.48 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/18/14 | 5708.48 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/17/14 | 5708.6 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/16/14 | 5708.64 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/15/14 | 5708.56 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/14/14 | 5708.73 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/13/14 | 5708.79 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/12/14 | 5708.72 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/11/14 | 5708.69 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/10/14 | 5708.73 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/09/14 | 5708.72 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/08/14 | 5708.79 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/07/14 | 5708.95 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/06/14 | 5709.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/05/14 | 5709.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/04/14 | 5708.96 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 04/03/14 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/02/14 | 5708.96 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/01/14 | 5708.86 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/31/14 | 5708.82 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/30/14 | 5708.71 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/29/14 | 5708.63 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/28/14 | 5708.72 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/27/14 | 5708.73 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/26/14 | 5708.61 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/25/14 | 5708.52 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/24/14 | 5708.59 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/23/14 | 5708.65 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/22/14 | 5708.69 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/21/14 | 5708.71 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/20/14 | 5708.65 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/19/14 | 5708.73 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/18/14 | 5708.86 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/17/14 | 5708.65 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/16/14 | 5708.64 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/15/14 | 5708.7 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/14/14 | 5708.71 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/13/14 | 5708.61 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/12/14 | 5708.68 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/11/14 | 5708.76 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/10/14 | 5708.66 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/09/14 | 5708.65 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/08/14 | 5708.82 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/07/14 | 5708.82 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/06/14 | 5708.73 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/05/14 | 5708.84 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/04/14 | 5708.79 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/03/14 | 5708.79 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/02/14 | 5708.85 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 03/01/14 | 5708.81 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/28/14 | 5708.87 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/27/14 | 5708.78 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/26/14 | 5708.77 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/25/14 | 5708.75 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/24/14 | 5708.78 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/23/14 | 5708.85 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/22/14 | 5708.87 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/21/14 | 5708.82 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/20/14 | 5708.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/19/14 | 5708.82 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/18/14 | 5708.79 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/17/14 | 5708.78 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/16/14 | 5708.8 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/15/14 | 5708.8 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/14/14 | 5708.85 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/13/14 | 5708.83 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 02/12/14 | 5708.83 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/11/14 | 5708.9 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/10/14 | 5708.92 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/10/14 | 5708.91 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/09/14 | 5708.89 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/08/14 | 5708.96 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/07/14 | 5709 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/06/14 | 5708.97 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/05/14 | 5709.03 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/04/14 | 5709.13 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/03/14 | 5709.04 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/02/14 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 02/01/14 | 5709.12 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/31/14 | 5709.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/30/14 | 5708.95 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/29/14 | 5708.87 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/28/14 | 5708.97 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/27/14 | 5708.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/26/14 | 5708.9 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/25/14 | 5708.79 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/24/14 | 5708.77 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/23/14 | 5708.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/22/14 | 5708.83 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/21/14 | 5708.76 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/20/14 | 5708.88 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/19/14 | 5708.84 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/18/14 | 5708.9 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/17/14 | 5708.87 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/16/14 | 5708.88 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/15/14 | 5708.83 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/14/14 | 5708.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/13/14 | 5709.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/12/14 | 5709.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/11/14 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/10/14 | 5709.11 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/09/14 | 5709.04 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/08/14 | 5709.04 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/07/14 | 5708.97 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/06/14 | 5709.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/05/14 | 5709.11 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/04/14 | 5709.09 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/03/14 | 5708.95 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/02/14 | 5708.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 01/01/14 | 5709.01 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/31/13 | 5708.95 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/30/13 | 5709.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/29/13 | 5709.09 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/28/13 | 5708.98 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/27/13 | 5708.95 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/26/13 | 5708.97 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 12/25/13 | 5709.04 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/24/13 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/23/13 | 5709.17 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/22/13 | 5709.36 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/21/13 | 5709.38 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/20/13 | 5709.27 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/19/13 | 5709.14 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/18/13 | 5708.98 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/17/13 | 5708.98 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/16/13 | 5709.01 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/15/13 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/14/13 | 5709.18 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/13/13 | 5709.16 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/12/13 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/11/13 | 5709.2 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/10/13 | 5709.21 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/09/13 | 5709.38 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/08/13 | 5709.41 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/07/13 | 5709.31 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/06/13 | 5709.39 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/05/13 | 5709.4 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/04/13 | 5709.41 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/03/13 | 5709.27 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/02/13 | 5709.12 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 12/01/13 | 5709.07 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/30/13 | 5709.1 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/29/13 | 5709.13 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/28/13 | 5709.17 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/27/13 | 5709.13 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/26/13 | 5709.19 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/25/13 | 5709.28 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/24/13 | 5709.15 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/23/13 | 5709.16 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/22/13 | 5709.26 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/21/13 | 5709.34 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/20/13 | 5709.36 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/19/13 | 5709.28 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/18/13 | 5709.32 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/17/13 | 5709.49 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/16/13 | 5709.48 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/15/13 | 5709.33 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/14/13 | 5709.22 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/13/13 | 5709.08 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/12/13 | 5709.16 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/11/13 | 5709.22 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/10/13 | 5709.24 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/09/13 | 5709.26 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/08/13 | 5709.19 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/07/13 | 5709.17 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/06/13 | 5709.28 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 11/05/13 | 5709.39 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/04/13 | 5709.32 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/03/13 | 5709.22 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/02/13 | 5709.15 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 11/01/13 | 5709.28 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/31/13 | 5709.32 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/30/13 | 5709.3 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/29/13 | 5709.26 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/28/13 | 5709.2 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/27/13 | 5709.07 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/26/13 | 5709.09 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/25/13 | 5709.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/24/13 | 5709.07 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/23/13 | 5709.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/22/13 | 5709.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/21/13 | 5709.14 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/20/13 | 5709.1 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/19/13 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/18/13 | 5709.11 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/17/13 | 5709.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/16/13 | 5709.06 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/15/13 | 5709.07 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/14/13 | 5709.07 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/13/13 | 5709.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/12/13 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/11/13 | 5709.09 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/10/13 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/09/13 | 5709 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/08/13 | 5708.91 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/07/13 | 5708.84 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/06/13 | 5708.86 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/05/13 | 5708.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/04/13 | 5709.05 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/03/13 | 5708.99 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/02/13 | 5708.96 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 10/01/13 | 5708.97 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/30/13 | 5708.93 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/29/13 | 5708.89 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/28/13 | 5708.97 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/27/13 | 5709.02 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/26/13 | 5708.99 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/25/13 | 5708.9 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/24/13 | 5708.88 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/23/13 | 5708.97 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/22/13 | 5708.85 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/21/13 | 5708.75 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/20/13 | 5708.77 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/19/13 | 5708.78 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/18/13 | 5708.73 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/17/13 | 5708.68 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 09/16/13 | 5708.7 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/15/13 | 5708.74 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/14/13 | 5708.72 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/13/13 | 5708.58 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/12/13 | 5708.46 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/11/13 | 5708.47 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/10/13 | 5708.46 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/09/13 | 5708.44 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/08/13 | 5708.39 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/07/13 | 5708.36 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/06/13 | 5708.33 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/05/13 | 5708.33 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/04/13 | 5708.36 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/03/13 | 5708.37 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/02/13 | 5708.37 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/01/13 | 5708.38 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/31/13 | 5708.35 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/30/13 | 5708.34 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/29/13 | 5708.34 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/28/13 | 5708.37 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/27/13 | 5708.34 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/26/13 | 5708.32 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/25/13 | 5708.35 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/24/13 | 5708.4 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/23/13 | 5708.41 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/22/13 | 5708.44 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/21/13 | 5708.49 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/20/13 | 5708.5 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/19/13 | 5708.51 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/18/13 | 5708.54 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/17/13 | 5708.56 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/16/13 | 5708.61 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/15/13 | 5708.62 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/14/13 | 5708.63 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/13/13 | 5708.64 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/13/13 | 5708.61 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/12/13 | 5708.626 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/11/13 | 5708.587 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/10/13 | 5708.6 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/09/13 | 5708.637 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/08/13 | 5708.627 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/07/13 | 5708.597 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/06/13 | 5708.594 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/05/13 | 5708.53 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/04/13 | 5708.533 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/03/13 | 5708.524 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/02/13 | 5708.505 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/01/13 | 5708.478 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/31/13 | 5708.491 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/30/13 | 5708.543 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 07/29/13 | 5708.574 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/28/13 | 5708.488 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/27/13 | 5708.409 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/26/13 | 5708.375 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/25/13 | 5708.406 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/24/13 | 5708.424 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/23/13 | 5708.418 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/22/13 | 5708.386 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/21/13 | 5708.365 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/20/13 | 5708.278 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/19/13 | 5708.232 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/18/13 | 5708.192 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/17/13 | 5708.226 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/16/13 | 5708.269 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/15/13 | 5708.279 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/14/13 | 5708.262 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/13/13 | 5708.264 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/12/13 | 5708.286 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/11/13 | 5708.256 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/10/13 | 5708.272 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/09/13 | 5708.3 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/08/13 | 5708.347 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/07/13 | 5708.355 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/06/13 | 5708.355 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/05/13 | 5708.331 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/04/13 | 5708.328 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/03/13 | 5708.255 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/02/13 | 5708.242 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/01/13 | 5708.265 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/30/13 | 5708.271 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/29/13 | 5708.261 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/28/13 | 5708.313 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/27/13 | 5708.375 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/26/13 | 5708.407 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/25/13 | 5708.43 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/24/13 | 5708.444 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/23/13 | 5708.462 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/22/13 | 5708.481 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/21/13 | 5708.494 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/20/13 | 5708.497 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/19/13 | 5708.479 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/18/13 | 5708.402 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/17/13 | 5708.365 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/16/13 | 5708.347 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/15/13 | 5708.378 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/14/13 | 5708.362 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/13/13 | 5708.345 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/12/13 | 5708.385 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/11/13 | 5708.421 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/10/13 | 5708.401 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 06/09/13 | 5708.431 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/08/13 | 5708.438 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/07/13 | 5708.384 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/06/13 | 5708.409 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/05/13 | 5708.427 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/04/13 | 5708.415 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/03/13 | 5708.363 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/02/13 | 5708.32 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 06/01/13 | 5708.396 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/31/13 | 5708.467 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/30/13 | 5708.482 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/29/13 | 5708.45 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/28/13 | 5708.319 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/27/13 | 5708.228 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/26/13 | 5708.187 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/25/13 | 5708.167 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/24/13 | 5708.191 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/23/13 | 5708.226 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/22/13 | 5708.212 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/21/13 | 5708.193 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/20/13 | 5708.21 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/19/13 | 5708.186 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/18/13 | 5708.162 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/17/13 | 5708.133 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/16/13 | 5708.097 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/15/13 | 5708.054 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/14/13 | 5707.984 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/13/13 | 5707.988 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/12/13 | 5707.962 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/11/13 | 5707.997 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/10/13 | 5708.09 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/09/13 | 5708.13 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/08/13 | 5708.134 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/07/13 | 5708.07 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/06/13 | 5708.03 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/05/13 | 5708.017 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/04/13 | 5708.042 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/03/13 | 5707.933 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/02/13 | 5708.048 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 05/01/13 | 5708.197 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/30/13 | 5708.146 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/29/13 | 5708.044 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/28/13 | 5707.966 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/27/13 | 5707.906 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/26/13 | 5707.983 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/25/13 | 5707.961 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/24/13 | 5707.948 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 04/24/13 | 5707.91 | Manual | 874 | 897 | Regional |
| R-10 S1 | 03/18/13 | 5708.01 | Manual | 874 | 897 | Regional |
| R-10 S1 | 09/18/12 | 5708.474 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 09/17/12 | 5708.505 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/16/12 | 5708.432 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/15/12 | 5708.385 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/14/12 | 5708.427 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/13/12 | 5708.558 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/12/12 | 5708.611 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/11/12 | 5708.604 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/10/12 | 5708.556 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/09/12 | 5708.526 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/08/12 | 5708.557 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/07/12 | 5708.633 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/06/12 | 5708.601 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/05/12 | 5708.598 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/04/12 | 5708.547 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/03/12 | 5708.527 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/02/12 | 5708.497 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 09/01/12 | 5708.479 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/31/12 | 5708.477 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/30/12 | 5708.455 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/29/12 | 5708.407 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/28/12 | 5708.434 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/27/12 | 5708.506 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/26/12 | 5708.593 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/25/12 | 5708.658 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/24/12 | 5708.634 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/23/12 | 5708.577 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/22/12 | 5708.534 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/21/12 | 5708.535 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/20/12 | 5708.507 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/19/12 | 5708.52 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/18/12 | 5708.536 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/17/12 | 5708.545 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/16/12 | 5708.601 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/15/12 | 5708.605 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/14/12 | 5708.561 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/13/12 | 5708.497 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/12/12 | 5708.523 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/11/12 | 5708.515 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/10/12 | 5708.501 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/09/12 | 5708.475 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/08/12 | 5708.522 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/08/12 | 5708.48 | Manual | 874 | 897 | Regional |
| R-10 S1 | 08/07/12 | 5708.518 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/06/12 | 5708.446 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/05/12 | 5708.523 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/04/12 | 5708.645 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/03/12 | 5708.628 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/02/12 | 5708.698 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 08/01/12 | 5708.579 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/31/12 | 5708.594 | Transducer | 874 | 897 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S1 | 07/30/12 | 5708.584 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/29/12 | 5708.55 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/28/12 | 5708.549 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/27/12 | 5708.602 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/26/12 | 5708.657 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/25/12 | 5708.6 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/24/12 | 5708.533 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/23/12 | 5708.521 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/22/12 | 5708.503 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/21/12 | 5708.458 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/20/12 | 5708.491 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/19/12 | 5708.527 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/18/12 | 5708.59 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/17/12 | 5708.598 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/16/12 | 5708.542 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/15/12 | 5708.533 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/14/12 | 5708.553 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/13/12 | 5708.575 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/12/12 | 5708.575 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/11/12 | 5708.542 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/10/12 | 5708.536 | Transducer | 874 | 897 | Regional |
| R-10 S1 | 07/09/12 | 5708.543 | Transducer | 874 | 897 | Regional |
| R-10 S2 | 09/08/14 | 5695.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/07/14 | 5695.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/06/14 | 5695.84 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/05/14 | 5695.87 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/04/14 | 5695.9 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/03/14 | 5695.85 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/02/14 | 5695.97 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/01/14 | 5695.99 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/31/14 | 5695.97 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/30/14 | 5695.96 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/29/14 | 5695.93 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/28/14 | 5695.97 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/27/14 | 5695.92 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/26/14 | 5695.9 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/25/14 | 5695.79 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/24/14 | 5695.85 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/23/14 | 5695.79 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/22/14 | 5695.81 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/21/14 | 5695.88 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/20/14 | 5695.91 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/19/14 | 5695.95 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/18/14 | 5695.87 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/17/14 | 5695.87 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/16/14 | 5695.85 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/15/14 | 5695.79 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/14/14 | 5695.86 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/13/14 | 5695.91 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/12/14 | 5696 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 08/11/14 | 5696.14 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/10/14 | 5696.28 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/09/14 | 5696.28 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/08/14 | 5696.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/07/14 | 5696.06 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/06/14 | 5695.89 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/05/14 | 5695.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/04/14 | 5695.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/03/14 | 5695.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/02/14 | 5695.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/01/14 | 5695.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/31/14 | 5695.47 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/30/14 | 5695.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/29/14 | 5695.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/28/14 | 5695.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/27/14 | 5695.48 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/26/14 | 5695.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/25/14 | 5695.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/24/14 | 5695.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/23/14 | 5695.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/22/14 | 5695.76 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/21/14 | 5695.69 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/20/14 | 5695.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/19/14 | 5695.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/18/14 | 5695.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/17/14 | 5695.34 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/16/14 | 5695.31 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/15/14 | 5695.29 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/14/14 | 5695.26 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/13/14 | 5695.36 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/12/14 | 5695.36 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/11/14 | 5695.32 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/10/14 | 5695.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/09/14 | 5695.36 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/08/14 | 5695.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/07/14 | 5695.3 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/06/14 | 5695.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/05/14 | 5695.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/04/14 | 5695.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/03/14 | 5695.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/02/14 | 5695.67 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/01/14 | 5695.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/30/14 | 5695.67 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/29/14 | 5695.82 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/28/14 | 5695.95 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/27/14 | 5695.89 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/26/14 | 5695.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/25/14 | 5695.76 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/24/14 | 5695.66 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/23/14 | 5695.48 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 06/22/14 | 5695.34 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/21/14 | 5695.13 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/20/14 | 5695.09 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/19/14 | 5695.1 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/18/14 | 5695.01 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/17/14 | 5694.94 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/16/14 | 5694.71 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/15/14 | 5694.81 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/14/14 | 5694.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/13/14 | 5694.25 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/12/14 | 5694.63 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/11/14 | 5694.42 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/10/14 | 5694.26 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/09/14 | 5694.11 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/08/14 | 5694.24 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/07/14 | 5694.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/06/14 | 5694.38 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/05/14 | 5694.2 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/04/14 | 5694.15 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/03/14 | 5695.9 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/02/14 | 5695.82 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/01/14 | 5695.79 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/31/14 | 5695.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/30/14 | 5695.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/29/14 | 5695.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/28/14 | 5695.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/27/14 | 5695.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/26/14 | 5695.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/25/14 | 5695.42 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/24/14 | 5695.37 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/23/14 | 5695.28 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/22/14 | 5695.26 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/21/14 | 5695.23 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/20/14 | 5695.1 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/19/14 | 5695.08 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/18/14 | 5695.09 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/17/14 | 5695 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/16/14 | 5695.1 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/15/14 | 5695.08 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/14/14 | 5695.16 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/13/14 | 5695.22 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/12/14 | 5695.22 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/11/14 | 5695.13 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/10/14 | 5695.07 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/09/14 | 5694.99 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/08/14 | 5694.99 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/07/14 | 5694.92 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/06/14 | 5694.89 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/05/14 | 5694.89 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/04/14 | 5694.9 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 05/03/14 | 5694.97 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/02/14 | 5694.99 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/01/14 | 5695 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/30/14 | 5695.01 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/29/14 | 5695.07 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/28/14 | 5694.94 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/27/14 | 5694.91 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/26/14 | 5694.74 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/25/14 | 5694.67 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/24/14 | 5694.71 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/23/14 | 5694.64 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/22/14 | 5694.55 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/21/14 | 5694.61 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/20/14 | 5694.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/19/14 | 5694.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/18/14 | 5694.69 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/17/14 | 5694.74 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/16/14 | 5694.74 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/15/14 | 5694.84 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/14/14 | 5694.83 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/13/14 | 5694.84 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/12/14 | 5694.76 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/11/14 | 5694.66 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/10/14 | 5694.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/09/14 | 5694.71 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/08/14 | 5694.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/07/14 | 5694.9 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/06/14 | 5694.92 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/05/14 | 5694.92 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/04/14 | 5694.87 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/03/14 | 5695.1 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/02/14 | 5694.91 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/01/14 | 5694.85 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/31/14 | 5694.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/30/14 | 5694.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/29/14 | 5694.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/28/14 | 5694.35 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/27/14 | 5694.34 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/26/14 | 5694.3 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/25/14 | 5694.25 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/24/14 | 5694.32 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/23/14 | 5694.29 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/22/14 | 5696.2 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/21/14 | 5696.25 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/20/14 | 5696.16 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/19/14 | 5696.14 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/18/14 | 5696.17 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/17/14 | 5696.05 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/16/14 | 5696.02 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/15/14 | 5696.05 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 03/14/14 | 5695.95 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/13/14 | 5695.97 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/12/14 | 5695.88 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/11/14 | 5695.9 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/10/14 | 5695.81 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/09/14 | 5695.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/08/14 | 5695.86 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/07/14 | 5695.84 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/06/14 | 5695.83 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/05/14 | 5695.82 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/04/14 | 5695.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/03/14 | 5695.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/02/14 | 5695.71 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/01/14 | 5695.76 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/28/14 | 5695.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/27/14 | 5695.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/26/14 | 5695.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/25/14 | 5695.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/24/14 | 5695.64 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/23/14 | 5695.63 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/22/14 | 5695.67 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/21/14 | 5695.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/20/14 | 5695.62 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/19/14 | 5695.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/18/14 | 5695.47 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/17/14 | 5695.42 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/16/14 | 5695.35 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/15/14 | 5695.28 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/14/14 | 5695.26 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/13/14 | 5695.15 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/12/14 | 5694.94 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/11/14 | 5695.77 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/10/14 | 5695.77 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/10/14 | 5695.74 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/09/14 | 5695.74 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/08/14 | 5695.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/07/14 | 5695.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/06/14 | 5695.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/05/14 | 5695.37 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/04/14 | 5695.25 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/03/14 | 5695.42 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/02/14 | 5695.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/01/14 | 5695.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/31/14 | 5695.23 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/30/14 | 5694.99 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/29/14 | 5695.23 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/28/14 | 5695.22 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/27/14 | 5695.15 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/26/14 | 5694.96 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/25/14 | 5694.86 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 01/24/14 | 5694.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/23/14 | 5695.86 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/22/14 | 5695.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/21/14 | 5695.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/20/14 | 5695.3 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/19/14 | 5695.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/18/14 | 5695.74 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/17/14 | 5695.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/16/14 | 5695.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/15/14 | 5695.36 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/14/14 | 5695.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/13/14 | 5695.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/12/14 | 5695.54 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/11/14 | 5695.46 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/10/14 | 5695.38 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/09/14 | 5695.38 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/08/14 | 5695.35 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/07/14 | 5695.21 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/06/14 | 5695.18 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/05/14 | 5695.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/04/14 | 5695.42 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/03/14 | 5695.3 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/02/14 | 5695.38 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/01/14 | 5695.24 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/31/13 | 5695.29 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/30/13 | 5695.32 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/29/13 | 5695.26 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/28/13 | 5695.24 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/27/13 | 5695.19 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/26/13 | 5695.1 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/25/13 | 5695.27 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/24/13 | 5695.25 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/23/13 | 5695.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/22/13 | 5695.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/21/13 | 5695.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/20/13 | 5695.37 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/19/13 | 5695.27 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/18/13 | 5695.15 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/17/13 | 5695.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/16/13 | 5695.36 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/15/13 | 5695.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/14/13 | 5695.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/13/13 | 5695.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/12/13 | 5695.47 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/11/13 | 5695.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/10/13 | 5695.55 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/09/13 | 5695.61 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/08/13 | 5695.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/07/13 | 5695.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/06/13 | 5695.57 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 12/05/13 | 5695.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/04/13 | 5695.63 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/03/13 | 5695.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/02/13 | 5695.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/01/13 | 5695.35 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/30/13 | 5695.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/29/13 | 5695.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/28/13 | 5695.45 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/27/13 | 5695.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/26/13 | 5695.48 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/25/13 | 5695.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/24/13 | 5695.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/23/13 | 5695.42 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/22/13 | 5695.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/21/13 | 5695.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/20/13 | 5695.86 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/19/13 | 5695.75 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/18/13 | 5695.78 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/17/13 | 5695.95 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/16/13 | 5695.77 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/15/13 | 5695.64 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/14/13 | 5695.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/13/13 | 5695.36 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/12/13 | 5696.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/11/13 | 5696.31 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/10/13 | 5696.29 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/09/13 | 5696.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/08/13 | 5696.3 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/07/13 | 5696.29 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/06/13 | 5696.2 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/05/13 | 5696.23 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/04/13 | 5696.12 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/03/13 | 5696.06 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/02/13 | 5696.03 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/01/13 | 5696.01 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/31/13 | 5696.03 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/30/13 | 5695.91 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/29/13 | 5695.85 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/28/13 | 5695.86 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/27/13 | 5695.82 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/26/13 | 5695.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/25/13 | 5695.69 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/24/13 | 5695.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/23/13 | 5695.62 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/22/13 | 5695.61 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/21/13 | 5695.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/20/13 | 5695.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/19/13 | 5695.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/18/13 | 5695.48 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/17/13 | 5695.46 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 10/16/13 | 5695.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/15/13 | 5695.48 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/14/13 | 5695.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/13/13 | 5695.37 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/12/13 | 5695.35 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/11/13 | 5695.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/10/13 | 5695.54 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/09/13 | 5695.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/08/13 | 5695.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/07/13 | 5695.21 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/06/13 | 5695.13 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/05/13 | 5695.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/04/13 | 5695.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/03/13 | 5695.42 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/02/13 | 5695.31 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/01/13 | 5695.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/30/13 | 5695.31 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/29/13 | 5695.23 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/28/13 | 5695.31 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/27/13 | 5695.48 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/26/13 | 5695.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/25/13 | 5695.35 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/24/13 | 5695.34 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/23/13 | 5695.13 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/22/13 | 5694.98 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/21/13 | 5694.88 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/20/13 | 5694.83 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/19/13 | 5694.85 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/18/13 | 5694.76 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/17/13 | 5694.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/16/13 | 5694.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/15/13 | 5694.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/14/13 | 5694.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/13/13 | 5694.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/12/13 | 5694.25 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/11/13 | 5694.16 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/10/13 | 5694.13 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/09/13 | 5694.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/08/13 | 5694.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/07/13 | 5694.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/06/13 | 5694.38 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/05/13 | 5694.34 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/04/13 | 5694.31 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/03/13 | 5694.28 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/02/13 | 5694.24 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/01/13 | 5694.21 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/31/13 | 5694.13 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/30/13 | 5694.12 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/29/13 | 5694.19 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/28/13 | 5694.16 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 08/27/13 | 5694.13 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/26/13 | 5694.11 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/25/13 | 5694.14 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/24/13 | 5694.18 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/23/13 | 5694.19 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/22/13 | 5694.25 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/21/13 | 5694.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/20/13 | 5694.33 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/19/13 | 5694.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/18/13 | 5694.47 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/17/13 | 5694.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/16/13 | 5694.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/15/13 | 5694.62 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/14/13 | 5694.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/13/13 | 5694.652 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/13/13 | 5694.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/12/13 | 5694.636 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/11/13 | 5694.587 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/10/13 | 5694.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/09/13 | 5694.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/08/13 | 5694.556 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/07/13 | 5694.457 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/06/13 | 5694.455 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/05/13 | 5694.403 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/04/13 | 5694.458 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/03/13 | 5694.439 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/02/13 | 5694.372 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/01/13 | 5694.346 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/31/13 | 5694.427 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/30/13 | 5694.377 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/29/13 | 5694.386 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/28/13 | 5694.307 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/27/13 | 5694.293 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/26/13 | 5694.193 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/25/13 | 5694.271 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/24/13 | 5694.255 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/23/13 | 5694.162 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/22/13 | 5694.166 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/21/13 | 5694.107 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/20/13 | 5694.022 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/19/13 | 5693.914 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/18/13 | 5693.96 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/17/13 | 5694.089 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/16/13 | 5693.977 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/15/13 | 5694.009 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/14/13 | 5694.299 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/13/13 | 5694.24 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/12/13 | 5694.01 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/11/13 | 5693.987 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/10/13 | 5694.057 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 07/09/13 | 5693.991 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/08/13 | 5694.612 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/07/13 | 5694.491 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/06/13 | 5694.477 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/05/13 | 5694.323 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/04/13 | 5694.225 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/03/13 | 5694.284 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/02/13 | 5694.301 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 07/01/13 | 5694.312 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/30/13 | 5694.163 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/29/13 | 5694.179 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/28/13 | 5694.268 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/27/13 | 5694.312 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/26/13 | 5694.387 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/25/13 | 5694.288 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/24/13 | 5694.343 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/23/13 | 5694.334 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/22/13 | 5694.417 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/21/13 | 5694.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/20/13 | 5694.471 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/19/13 | 5694.362 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/18/13 | 5694.366 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/17/13 | 5694.322 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/16/13 | 5694.311 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/15/13 | 5694.28 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/14/13 | 5694.253 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/13/13 | 5694.221 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/12/13 | 5694.237 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/11/13 | 5694.292 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/10/13 | 5694.17 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/09/13 | 5694.167 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/08/13 | 5694.406 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/07/13 | 5694.382 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/06/13 | 5694.308 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/05/13 | 5694.378 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/04/13 | 5694.331 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/03/13 | 5694.152 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/02/13 | 5694.218 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 06/01/13 | 5694.184 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/31/13 | 5694.277 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/30/13 | 5694.2 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/29/13 | 5694.103 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/28/13 | 5693.959 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/27/13 | 5693.877 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/26/13 | 5693.796 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/25/13 | 5693.82 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/24/13 | 5693.771 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/23/13 | 5693.907 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/22/13 | 5693.778 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/21/13 | 5693.77 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 05/20/13 | 5693.812 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/19/13 | 5693.708 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/18/13 | 5693.756 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/17/13 | 5693.739 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/16/13 | 5693.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/16/13 | 5693.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/16/13 | 5693.61 | Manual | 1042 | 1065 | Regional |
| R-10 S2 | 05/15/13 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/14/13 | 5693.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/13/13 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/12/13 | 5693.55 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/11/13 | 5693.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/10/13 | 5693.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/09/13 | 5693.67 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/08/13 | 5693.61 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/07/13 | 5693.54 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/06/13 | 5693.48 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/05/13 | 5693.47 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/04/13 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/03/13 | 5693.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/02/13 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 05/01/13 | 5693.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/30/13 | 5693.64 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/29/13 | 5693.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/28/13 | 5693.49 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/27/13 | 5693.34 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/26/13 | 5693.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/25/13 | 5693.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/24/13 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/23/13 | 5693.7 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/22/13 | 5693.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/21/13 | 5693.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/20/13 | 5693.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/19/13 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/18/13 | 5693.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/17/13 | 5693.94 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/16/13 | 5693.96 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/15/13 | 5693.86 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/14/13 | 5693.82 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/13/13 | 5693.79 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/12/13 | 5693.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/11/13 | 5693.76 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/10/13 | 5693.87 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/09/13 | 5693.75 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/08/13 | 5693.57 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/07/13 | 5693.54 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/06/13 | 5693.47 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/05/13 | 5693.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/04/13 | 5693.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/03/13 | 5693.62 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 04/02/13 | 5693.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 04/01/13 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/31/13 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/30/13 | 5693.62 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/29/13 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/28/13 | 5693.63 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/27/13 | 5693.64 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/26/13 | 5693.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/25/13 | 5693.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/24/13 | 5693.61 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/23/13 | 5693.71 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/22/13 | 5693.66 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/21/13 | 5693.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/20/13 | 5693.42 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/19/13 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 03/18/13 | 5693.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/12/13 | 5693.66 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/11/13 | 5693.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/10/13 | 5693.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/09/13 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/08/13 | 5693.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/07/13 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/06/13 | 5693.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/05/13 | 5693.48 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/04/13 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/03/13 | 5693.45 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/02/13 | 5693.54 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 02/01/13 | 5693.57 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/31/13 | 5693.62 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/30/13 | 5693.63 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/29/13 | 5693.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/28/13 | 5693.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/27/13 | 5693.57 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/26/13 | 5693.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/25/13 | 5693.49 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/24/13 | 5693.46 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/23/13 | 5693.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/22/13 | 5693.5 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/21/13 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/20/13 | 5693.47 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/19/13 | 5693.57 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/18/13 | 5693.46 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/17/13 | 5693.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/16/13 | 5693.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/15/13 | 5693.75 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/14/13 | 5693.7 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/13/13 | 5693.78 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/12/13 | 5693.7 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/11/13 | 5693.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/10/13 | 5693.56 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 01/09/13 | 5693.63 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/08/13 | 5693.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/07/13 | 5693.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/06/13 | 5693.54 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/05/13 | 5693.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/04/13 | 5693.69 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/03/13 | 5693.84 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/02/13 | 5693.76 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 01/01/13 | 5693.97 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/31/12 | 5694.01 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/30/12 | 5693.86 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/29/12 | 5693.89 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/28/12 | 5694.01 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/27/12 | 5693.88 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/26/12 | 5693.81 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/25/12 | 5694 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/24/12 | 5693.85 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/23/12 | 5693.83 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/22/12 | 5693.78 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/21/12 | 5693.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/20/12 | 5693.85 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/19/12 | 5693.97 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/18/12 | 5693.78 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/17/12 | 5693.82 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/16/12 | 5693.89 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/15/12 | 5693.81 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/14/12 | 5693.67 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/13/12 | 5693.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/12/12 | 5693.54 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/11/12 | 5693.73 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/10/12 | 5693.64 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/09/12 | 5693.77 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/08/12 | 5693.79 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/07/12 | 5693.74 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/06/12 | 5693.59 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/05/12 | 5693.6 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/04/12 | 5693.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/03/12 | 5693.66 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/02/12 | 5693.65 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 12/01/12 | 5693.49 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/30/12 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/29/12 | 5693.41 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/28/12 | 5693.48 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/27/12 | 5693.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/26/12 | 5693.57 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/25/12 | 5693.46 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/24/12 | 5693.38 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/23/12 | 5693.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/22/12 | 5693.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/21/12 | 5693.54 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 11/20/12 | 5693.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/19/12 | 5693.72 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/18/12 | 5693.69 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/17/12 | 5693.63 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/16/12 | 5693.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/15/12 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/14/12 | 5693.49 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/13/12 | 5693.52 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/12/12 | 5693.54 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/11/12 | 5693.61 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/10/12 | 5693.58 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/09/12 | 5693.57 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/08/12 | 5693.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/07/12 | 5693.37 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/06/12 | 5693.32 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/05/12 | 5693.32 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/04/12 | 5693.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/03/12 | 5693.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/02/12 | 5693.36 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 11/01/12 | 5693.34 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/31/12 | 5693.23 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/30/12 | 5693.29 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/29/12 | 5693.28 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/28/12 | 5693.22 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/27/12 | 5693.23 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/26/12 | 5693.36 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/25/12 | 5693.46 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/24/12 | 5693.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/23/12 | 5693.49 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/22/12 | 5693.44 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/21/12 | 5693.46 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/20/12 | 5693.43 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/19/12 | 5693.4 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/18/12 | 5693.53 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/17/12 | 5693.57 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/16/12 | 5693.51 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/15/12 | 5693.39 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/14/12 | 5693.56 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/13/12 | 5693.67 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/12/12 | 5693.61 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/11/12 | 5693.68 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/10/12 | 5693.7 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/09/12 | 5693.81 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/08/12 | 5693.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/07/12 | 5693.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/06/12 | 5693.84 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/05/12 | 5693.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/04/12 | 5693.81 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/03/12 | 5693.87 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 10/02/12 | 5693.84 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 10/01/12 | 5693.86 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/30/12 | 5693.8 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/29/12 | 5693.98 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/28/12 | 5694.03 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/27/12 | 5694.08 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/26/12 | 5694.08 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/25/12 | 5694.16 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/24/12 | 5694.11 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/23/12 | 5694.04 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/22/12 | 5694.11 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/21/12 | 5694.15 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/20/12 | 5694.16 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/19/12 | 5694.12 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/18/12 | 5694.09 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/18/12 | 5694.1 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/17/12 | 5694.055 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/16/12 | 5694.079 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/15/12 | 5694.06 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/14/12 | 5694.106 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/13/12 | 5694.22 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/12/12 | 5694.198 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/11/12 | 5694.277 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/10/12 | 5694.159 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/09/12 | 5694.221 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/08/12 | 5694.158 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/07/12 | 5694.215 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/06/12 | 5694.268 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/05/12 | 5694.182 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/04/12 | 5694.111 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/03/12 | 5694.149 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/02/12 | 5694.033 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 09/01/12 | 5693.991 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/31/12 | 5693.98 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/30/12 | 5693.952 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/29/12 | 5694.012 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/28/12 | 5694.036 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/27/12 | 5694.031 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/26/12 | 5694.129 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/25/12 | 5694.203 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/24/12 | 5694.255 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/23/12 | 5694.112 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/22/12 | 5694.686 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/21/12 | 5694.519 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/20/12 | 5694.511 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/19/12 | 5694.47 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/18/12 | 5694.363 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/17/12 | 5694.322 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/16/12 | 5694.437 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/15/12 | 5694.334 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/14/12 | 5694.292 | Transducer | 1042 | 1065 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10 S2 | 08/13/12 | 5694.289 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/12/12 | 5694.284 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/11/12 | 5694.273 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/10/12 | 5694.257 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/09/12 | 5694.213 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/08/12 | 5694.092 | Transducer | 1042 | 1065 | Regional |
| R-10 S2 | 08/08/12 | 5694.09 | Manual | 1042 | 1065 | Regional |
| R-10a | 09/08/14 | 5738.24 | Transducer | 690 | 700 | Regional |
| R-10a | 09/07/14 | 5738.21 | Transducer | 690 | 700 | Regional |
| R-10a | 09/06/14 | 5738.26 | Transducer | 690 | 700 | Regional |
| R-10a | 09/05/14 | 5738.35 | Transducer | 690 | 700 | Regional |
| R-10a | 09/04/14 | 5738.42 | Transducer | 690 | 700 | Regional |
| R-10a | 09/03/14 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 09/02/14 | 5738.38 | Transducer | 690 | 700 | Regional |
| R-10a | 09/01/14 | 5738.39 | Transducer | 690 | 700 | Regional |
| R-10a | 08/31/14 | 5738.35 | Transducer | 690 | 700 | Regional |
| R-10a | 08/30/14 | 5738.29 | Transducer | 690 | 700 | Regional |
| R-10a | 08/29/14 | 5738.32 | Transducer | 690 | 700 | Regional |
| R-10a | 08/28/14 | 5738.28 | Transducer | 690 | 700 | Regional |
| R-10a | 08/27/14 | 5738.27 | Transducer | 690 | 700 | Regional |
| R-10a | 08/26/14 | 5738.28 | Transducer | 690 | 700 | Regional |
| R-10a | 08/25/14 | 5738.32 | Transducer | 690 | 700 | Regional |
| R-10a | 08/24/14 | 5738.35 | Transducer | 690 | 700 | Regional |
| R-10a | 08/23/14 | 5738.32 | Transducer | 690 | 700 | Regional |
| R-10a | 08/22/14 | 5738.38 | Transducer | 690 | 700 | Regional |
| R-10a | 08/21/14 | 5738.38 | Transducer | 690 | 700 | Regional |
| R-10a | 08/20/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 08/19/14 | 5738.37 | Transducer | 690 | 700 | Regional |
| R-10a | 08/18/14 | 5738.32 | Transducer | 690 | 700 | Regional |
| R-10a | 08/17/14 | 5738.29 | Transducer | 690 | 700 | Regional |
| R-10a | 08/16/14 | 5738.33 | Transducer | 690 | 700 | Regional |
| R-10a | 08/15/14 | 5738.31 | Transducer | 690 | 700 | Regional |
| R-10a | 08/14/14 | 5738.28 | Transducer | 690 | 700 | Regional |
| R-10a | 08/13/14 | 5738.22 | Transducer | 690 | 700 | Regional |
| R-10a | 08/12/14 | 5738.2 | Transducer | 690 | 700 | Regional |
| R-10a | 08/11/14 | 5738.23 | Transducer | 690 | 700 | Regional |
| R-10a | 08/10/14 | 5738.31 | Transducer | 690 | 700 | Regional |
| R-10a | 08/09/14 | 5738.32 | Transducer | 690 | 700 | Regional |
| R-10a | 08/08/14 | 5738.34 | Transducer | 690 | 700 | Regional |
| R-10a | 08/07/14 | 5738.34 | Transducer | 690 | 700 | Regional |
| R-10a | 08/06/14 | 5738.29 | Transducer | 690 | 700 | Regional |
| R-10a | 08/05/14 | 5738.26 | Transducer | 690 | 700 | Regional |
| R-10a | 08/04/14 | 5738.26 | Transducer | 690 | 700 | Regional |
| R-10a | 08/03/14 | 5738.24 | Transducer | 690 | 700 | Regional |
| R-10a | 08/02/14 | 5738.27 | Transducer | 690 | 700 | Regional |
| R-10a | 08/01/14 | 5738.29 | Transducer | 690 | 700 | Regional |
| R-10a | 07/31/14 | 5738.22 | Transducer | 690 | 700 | Regional |
| R-10a | 07/30/14 | 5738.22 | Transducer | 690 | 700 | Regional |
| R-10a | 07/29/14 | 5738.19 | Transducer | 690 | 700 | Regional |
| R-10a | 07/28/14 | 5738.19 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 07/27/14 | 5738.24 | Transducer | 690 | 700 | Regional |
| R-10a | 07/26/14 | 5738.28 | Transducer | 690 | 700 | Regional |
| R-10a | 07/25/14 | 5738.23 | Transducer | 690 | 700 | Regional |
| R-10a | 07/24/14 | 5738.15 | Transducer | 690 | 700 | Regional |
| R-10a | 07/23/14 | 5738.18 | Transducer | 690 | 700 | Regional |
| R-10a | 07/22/14 | 5738.25 | Transducer | 690 | 700 | Regional |
| R-10a | 07/21/14 | 5738.33 | Transducer | 690 | 700 | Regional |
| R-10a | 07/20/14 | 5738.33 | Transducer | 690 | 700 | Regional |
| R-10a | 07/19/14 | 5738.36 | Transducer | 690 | 700 | Regional |
| R-10a | 07/18/14 | 5738.37 | Transducer | 690 | 700 | Regional |
| R-10a | 07/17/14 | 5738.38 | Transducer | 690 | 700 | Regional |
| R-10a | 07/16/14 | 5738.31 | Transducer | 690 | 700 | Regional |
| R-10a | 07/15/14 | 5738.21 | Transducer | 690 | 700 | Regional |
| R-10a | 07/14/14 | 5738.19 | Transducer | 690 | 700 | Regional |
| R-10a | 07/13/14 | 5738.25 | Transducer | 690 | 700 | Regional |
| R-10a | 07/12/14 | 5738.28 | Transducer | 690 | 700 | Regional |
| R-10a | 07/11/14 | 5738.29 | Transducer | 690 | 700 | Regional |
| R-10a | 07/10/14 | 5738.28 | Transducer | 690 | 700 | Regional |
| R-10a | 07/09/14 | 5738.23 | Transducer | 690 | 700 | Regional |
| R-10a | 07/08/14 | 5738.27 | Transducer | 690 | 700 | Regional |
| R-10a | 07/07/14 | 5738.28 | Transducer | 690 | 700 | Regional |
| R-10a | 07/06/14 | 5738.24 | Transducer | 690 | 700 | Regional |
| R-10a | 07/05/14 | 5738.2 | Transducer | 690 | 700 | Regional |
| R-10a | 07/04/14 | 5738.22 | Transducer | 690 | 700 | Regional |
| R-10a | 07/03/14 | 5738.25 | Transducer | 690 | 700 | Regional |
| R-10a | 07/02/14 | 5738.33 | Transducer | 690 | 700 | Regional |
| R-10a | 07/01/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 06/30/14 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 06/29/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 06/28/14 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 06/27/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 06/26/14 | 5738.34 | Transducer | 690 | 700 | Regional |
| R-10a | 06/25/14 | 5738.34 | Transducer | 690 | 700 | Regional |
| R-10a | 06/24/14 | 5738.31 | Transducer | 690 | 700 | Regional |
| R-10a | 06/23/14 | 5738.37 | Transducer | 690 | 700 | Regional |
| R-10a | 06/22/14 | 5738.35 | Transducer | 690 | 700 | Regional |
| R-10a | 06/21/14 | 5738.31 | Transducer | 690 | 700 | Regional |
| R-10a | 06/20/14 | 5738.35 | Transducer | 690 | 700 | Regional |
| R-10a | 06/19/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 06/18/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 06/17/14 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 06/16/14 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 06/15/14 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 06/14/14 | 5738.39 | Transducer | 690 | 700 | Regional |
| R-10a | 06/13/14 | 5738.33 | Transducer | 690 | 700 | Regional |
| R-10a | 06/12/14 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 06/11/14 | 5738.42 | Transducer | 690 | 700 | Regional |
| R-10a | 06/10/14 | 5738.37 | Transducer | 690 | 700 | Regional |
| R-10a | 06/09/14 | 5738.43 | Transducer | 690 | 700 | Regional |
| R-10a | 06/08/14 | 5738.46 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 06/07/14 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 06/06/14 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 06/05/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 06/04/14 | 5738.43 | Transducer | 690 | 700 | Regional |
| R-10a | 06/03/14 | 5738.39 | Transducer | 690 | 700 | Regional |
| R-10a | 06/02/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 06/01/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 05/31/14 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 05/30/14 | 5738.33 | Transducer | 690 | 700 | Regional |
| R-10a | 05/29/14 | 5738.35 | Transducer | 690 | 700 | Regional |
| R-10a | 05/28/14 | 5738.33 | Transducer | 690 | 700 | Regional |
| R-10a | 05/27/14 | 5738.36 | Transducer | 690 | 700 | Regional |
| R-10a | 05/26/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 05/25/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 05/24/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 05/23/14 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 05/22/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 05/21/14 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 05/20/14 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 05/19/14 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 05/18/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 05/17/14 | 5738.35 | Transducer | 690 | 700 | Regional |
| R-10a | 05/16/14 | 5738.28 | Transducer | 690 | 700 | Regional |
| R-10a | 05/15/14 | 5738.26 | Transducer | 690 | 700 | Regional |
| R-10a | 05/14/14 | 5738.26 | Transducer | 690 | 700 | Regional |
| R-10a | 05/13/14 | 5738.43 | Transducer | 690 | 700 | Regional |
| R-10a | 05/12/14 | 5738.56 | Transducer | 690 | 700 | Regional |
| R-10a | 05/11/14 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 05/10/14 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 05/09/14 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 05/08/14 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 05/07/14 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 05/06/14 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 05/05/14 | 5738.42 | Transducer | 690 | 700 | Regional |
| R-10a | 05/04/14 | 5738.43 | Transducer | 690 | 700 | Regional |
| R-10a | 05/03/14 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 05/02/14 | 5738.38 | Transducer | 690 | 700 | Regional |
| R-10a | 05/01/14 | 5738.37 | Transducer | 690 | 700 | Regional |
| R-10a | 04/30/14 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 04/29/14 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 04/28/14 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 04/27/14 | 5738.72 | Transducer | 690 | 700 | Regional |
| R-10a | 04/26/14 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 04/25/14 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 04/24/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 04/23/14 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 04/22/14 | 5738.38 | Transducer | 690 | 700 | Regional |
| R-10a | 04/21/14 | 5738.43 | Transducer | 690 | 700 | Regional |
| R-10a | 04/20/14 | 5738.43 | Transducer | 690 | 700 | Regional |
| R-10a | 04/19/14 | 5738.44 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 04/18/14 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 04/17/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 04/16/14 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 04/15/14 | 5738.43 | Transducer | 690 | 700 | Regional |
| R-10a | 04/14/14 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 04/13/14 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 04/12/14 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 04/11/14 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 04/10/14 | 5738.43 | Transducer | 690 | 700 | Regional |
| R-10a | 04/09/14 | 5738.41 | Transducer | 690 | 700 | Regional |
| R-10a | 04/08/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 04/07/14 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 04/06/14 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 04/05/14 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 04/04/14 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 04/03/14 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 04/02/14 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 04/01/14 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 03/31/14 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 03/30/14 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 03/29/14 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 03/28/14 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 03/27/14 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 03/26/14 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 03/25/14 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 03/24/14 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 03/23/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 03/22/14 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 03/21/14 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 03/20/14 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 03/19/14 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 03/18/14 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 03/17/14 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 03/16/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 03/15/14 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 03/14/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 03/13/14 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 03/12/14 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 03/11/14 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 03/10/14 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 03/09/14 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 03/08/14 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 03/07/14 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 03/06/14 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 03/05/14 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 03/04/14 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 03/03/14 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 03/02/14 | 5738.66 | Transducer | 690 | 700 | Regional |
| R-10a | 03/01/14 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 02/28/14 | 5738.67 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 02/27/14 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 02/26/14 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 02/25/14 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 02/24/14 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 02/23/14 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 02/22/14 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 02/21/14 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 02/20/14 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 02/19/14 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 02/18/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 02/17/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 02/16/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 02/15/14 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 02/14/14 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 02/13/14 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 02/12/14 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 02/11/14 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 02/10/14 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 02/10/14 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 02/09/14 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 02/08/14 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 02/07/14 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 02/06/14 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 02/05/14 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 02/04/14 | 5738.88 | Transducer | 690 | 700 | Regional |
| R-10a | 02/03/14 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 02/02/14 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 02/01/14 | 5738.91 | Transducer | 690 | 700 | Regional |
| R-10a | 01/31/14 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 01/30/14 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 01/29/14 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 01/28/14 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 01/27/14 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 01/26/14 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 01/25/14 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 01/24/14 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 01/23/14 | 5738.66 | Transducer | 690 | 700 | Regional |
| R-10a | 01/22/14 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 01/21/14 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 01/20/14 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 01/19/14 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 01/18/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 01/17/14 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 01/16/14 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 01/15/14 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 01/14/14 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 01/13/14 | 5738.66 | Transducer | 690 | 700 | Regional |
| R-10a | 01/12/14 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 01/11/14 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 01/10/14 | 5738.79 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 01/09/14 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 01/08/14 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 01/07/14 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 01/06/14 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 01/05/14 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 01/04/14 | 5738.72 | Transducer | 690 | 700 | Regional |
| R-10a | 01/03/14 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 01/02/14 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 01/01/14 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 12/31/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 12/30/13 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 12/29/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 12/28/13 | 5738.56 | Transducer | 690 | 700 | Regional |
| R-10a | 12/27/13 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 12/26/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 12/25/13 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 12/24/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 12/23/13 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 12/22/13 | 5738.94 | Transducer | 690 | 700 | Regional |
| R-10a | 12/21/13 | 5738.92 | Transducer | 690 | 700 | Regional |
| R-10a | 12/20/13 | 5738.82 | Transducer | 690 | 700 | Regional |
| R-10a | 12/19/13 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 12/18/13 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 12/17/13 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 12/16/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 12/15/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 12/14/13 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 12/13/13 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 12/12/13 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 12/11/13 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 12/10/13 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 12/09/13 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 12/08/13 | 5738.9 | Transducer | 690 | 700 | Regional |
| R-10a | 12/07/13 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 12/06/13 | 5738.88 | Transducer | 690 | 700 | Regional |
| R-10a | 12/05/13 | 5738.92 | Transducer | 690 | 700 | Regional |
| R-10a | 12/04/13 | 5738.91 | Transducer | 690 | 700 | Regional |
| R-10a | 12/03/13 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 12/02/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 12/01/13 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 11/30/13 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 11/29/13 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 11/28/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 11/27/13 | 5738.56 | Transducer | 690 | 700 | Regional |
| R-10a | 11/26/13 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 11/25/13 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 11/24/13 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 11/23/13 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 11/22/13 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 11/21/13 | 5738.79 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 11/20/13 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 11/19/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 11/18/13 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 11/17/13 | 5738.88 | Transducer | 690 | 700 | Regional |
| R-10a | 11/16/13 | 5738.85 | Transducer | 690 | 700 | Regional |
| R-10a | 11/15/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 11/14/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 11/13/13 | 5738.39 | Transducer | 690 | 700 | Regional |
| R-10a | 11/12/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 11/11/13 | 5738.56 | Transducer | 690 | 700 | Regional |
| R-10a | 11/10/13 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 11/09/13 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 11/08/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 11/07/13 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 11/06/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 11/05/13 | 5738.82 | Transducer | 690 | 700 | Regional |
| R-10a | 11/04/13 | 5738.72 | Transducer | 690 | 700 | Regional |
| R-10a | 11/03/13 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 11/02/13 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 11/01/13 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 10/31/13 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 10/30/13 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 10/29/13 | 5738.72 | Transducer | 690 | 700 | Regional |
| R-10a | 10/28/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 10/27/13 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 10/26/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 10/25/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 10/24/13 | 5738.56 | Transducer | 690 | 700 | Regional |
| R-10a | 10/23/13 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 10/22/13 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 10/21/13 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 10/20/13 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 10/19/13 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 10/18/13 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 10/17/13 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 10/16/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 10/15/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 10/14/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 10/13/13 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 10/12/13 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 10/11/13 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 10/10/13 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 10/09/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 10/08/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 10/07/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 10/06/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 10/05/13 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 10/04/13 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 10/03/13 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 10/02/13 | 5738.64 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 10/01/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 09/30/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 09/29/13 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 09/28/13 | 5738.74 | Transducer | 690 | 700 | Regional |
| R-10a | 09/27/13 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 09/26/13 | 5738.8 | Transducer | 690 | 700 | Regional |
| R-10a | 09/25/13 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 09/24/13 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 09/23/13 | 5738.8 | Transducer | 690 | 700 | Regional |
| R-10a | 09/22/13 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 09/21/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 09/20/13 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 09/19/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 09/18/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 09/17/13 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 09/16/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 09/15/13 | 5738.76 | Transducer | 690 | 700 | Regional |
| R-10a | 09/14/13 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 09/13/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 09/12/13 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 09/11/13 | 5738.66 | Transducer | 690 | 700 | Regional |
| R-10a | 09/10/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 09/09/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 09/08/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 09/07/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 09/06/13 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 09/05/13 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 09/04/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 09/03/13 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 09/02/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 09/01/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 08/31/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 08/30/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 08/29/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 08/28/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 08/27/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 08/26/13 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 08/25/13 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 08/24/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 08/23/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 08/22/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 08/21/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 08/20/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 08/19/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 08/18/13 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 08/17/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 08/16/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 08/15/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 08/14/13 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 08/13/13 | 5738.52 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 08/13/13 | 5738.52 | Manual | 690 | 700 | Regional |
| R-10a | 07/17/13 | 5738.399 | Transducer | 690 | 700 | Regional |
| R-10a | 07/16/13 | 5738.462 | Transducer | 690 | 700 | Regional |
| R-10a | 07/15/13 | 5738.476 | Transducer | 690 | 700 | Regional |
| R-10a | 07/14/13 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 07/13/13 | 5738.492 | Transducer | 690 | 700 | Regional |
| R-10a | 07/12/13 | 5738.499 | Transducer | 690 | 700 | Regional |
| R-10a | 07/11/13 | 5738.439 | Transducer | 690 | 700 | Regional |
| R-10a | 07/10/13 | 5738.439 | Transducer | 690 | 700 | Regional |
| R-10a | 07/09/13 | 5738.467 | Transducer | 690 | 700 | Regional |
| R-10a | 07/08/13 | 5738.517 | Transducer | 690 | 700 | Regional |
| R-10a | 07/07/13 | 5738.552 | Transducer | 690 | 700 | Regional |
| R-10a | 07/06/13 | 5738.563 | Transducer | 690 | 700 | Regional |
| R-10a | 07/05/13 | 5738.536 | Transducer | 690 | 700 | Regional |
| R-10a | 07/04/13 | 5738.528 | Transducer | 690 | 700 | Regional |
| R-10a | 07/03/13 | 5738.432 | Transducer | 690 | 700 | Regional |
| R-10a | 07/02/13 | 5738.413 | Transducer | 690 | 700 | Regional |
| R-10a | 07/01/13 | 5738.432 | Transducer | 690 | 700 | Regional |
| R-10a | 06/30/13 | 5738.455 | Transducer | 690 | 700 | Regional |
| R-10a | 06/29/13 | 5738.429 | Transducer | 690 | 700 | Regional |
| R-10a | 06/28/13 | 5738.454 | Transducer | 690 | 700 | Regional |
| R-10a | 06/27/13 | 5738.499 | Transducer | 690 | 700 | Regional |
| R-10a | 06/26/13 | 5738.548 | Transducer | 690 | 700 | Regional |
| R-10a | 06/25/13 | 5738.596 | Transducer | 690 | 700 | Regional |
| R-10a | 06/24/13 | 5738.599 | Transducer | 690 | 700 | Regional |
| R-10a | 06/23/13 | 5738.585 | Transducer | 690 | 700 | Regional |
| R-10a | 06/22/13 | 5738.569 | Transducer | 690 | 700 | Regional |
| R-10a | 06/21/13 | 5738.561 | Transducer | 690 | 700 | Regional |
| R-10a | 06/20/13 | 5738.565 | Transducer | 690 | 700 | Regional |
| R-10a | 06/19/13 | 5738.545 | Transducer | 690 | 700 | Regional |
| R-10a | 06/18/13 | 5738.487 | Transducer | 690 | 700 | Regional |
| R-10a | 06/17/13 | 5738.494 | Transducer | 690 | 700 | Regional |
| R-10a | 06/16/13 | 5738.479 | Transducer | 690 | 700 | Regional |
| R-10a | 06/15/13 | 5738.482 | Transducer | 690 | 700 | Regional |
| R-10a | 06/14/13 | 5738.474 | Transducer | 690 | 700 | Regional |
| R-10a | 06/13/13 | 5738.457 | Transducer | 690 | 700 | Regional |
| R-10a | 06/12/13 | 5738.496 | Transducer | 690 | 700 | Regional |
| R-10a | 06/11/13 | 5738.521 | Transducer | 690 | 700 | Regional |
| R-10a | 06/10/13 | 5738.529 | Transducer | 690 | 700 | Regional |
| R-10a | 06/09/13 | 5738.571 | Transducer | 690 | 700 | Regional |
| R-10a | 06/08/13 | 5738.553 | Transducer | 690 | 700 | Regional |
| R-10a | 06/07/13 | 5738.511 | Transducer | 690 | 700 | Regional |
| R-10a | 06/06/13 | 5738.538 | Transducer | 690 | 700 | Regional |
| R-10a | 06/05/13 | 5738.565 | Transducer | 690 | 700 | Regional |
| R-10a | 06/04/13 | 5738.576 | Transducer | 690 | 700 | Regional |
| R-10a | 06/03/13 | 5738.551 | Transducer | 690 | 700 | Regional |
| R-10a | 06/02/13 | 5738.512 | Transducer | 690 | 700 | Regional |
| R-10a | 06/01/13 | 5738.616 | Transducer | 690 | 700 | Regional |
| R-10a | 05/31/13 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 05/30/13 | 5738.736 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 05/29/13 | 5738.734 | Transducer | 690 | 700 | Regional |
| R-10a | 05/28/13 | 5738.639 | Transducer | 690 | 700 | Regional |
| R-10a | 05/27/13 | 5738.574 | Transducer | 690 | 700 | Regional |
| R-10a | 05/26/13 | 5738.554 | Transducer | 690 | 700 | Regional |
| R-10a | 05/25/13 | 5738.551 | Transducer | 690 | 700 | Regional |
| R-10a | 05/24/13 | 5738.577 | Transducer | 690 | 700 | Regional |
| R-10a | 05/23/13 | 5738.622 | Transducer | 690 | 700 | Regional |
| R-10a | 05/22/13 | 5738.622 | Transducer | 690 | 700 | Regional |
| R-10a | 05/21/13 | 5738.612 | Transducer | 690 | 700 | Regional |
| R-10a | 05/20/13 | 5738.643 | Transducer | 690 | 700 | Regional |
| R-10a | 05/19/13 | 5738.629 | Transducer | 690 | 700 | Regional |
| R-10a | 05/18/13 | 5738.595 | Transducer | 690 | 700 | Regional |
| R-10a | 05/17/13 | 5738.577 | Transducer | 690 | 700 | Regional |
| R-10a | 05/16/13 | 5738.542 | Transducer | 690 | 700 | Regional |
| R-10a | 05/16/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 05/16/13 | 5738.53 | Manual | 690 | 700 | Regional |
| R-10a | 05/15/13 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 05/14/13 | 5738.37 | Transducer | 690 | 700 | Regional |
| R-10a | 05/13/13 | 5738.34 | Transducer | 690 | 700 | Regional |
| R-10a | 05/12/13 | 5738.33 | Transducer | 690 | 700 | Regional |
| R-10a | 05/11/13 | 5738.38 | Transducer | 690 | 700 | Regional |
| R-10a | 05/10/13 | 5738.46 | Transducer | 690 | 700 | Regional |
| R-10a | 05/09/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 05/08/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 05/07/13 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 05/06/13 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 05/05/13 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 05/04/13 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 05/03/13 | 5738.31 | Transducer | 690 | 700 | Regional |
| R-10a | 05/02/13 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 05/01/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 04/30/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 04/29/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 04/28/13 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 04/27/13 | 5738.37 | Transducer | 690 | 700 | Regional |
| R-10a | 04/26/13 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 04/25/13 | 5738.42 | Transducer | 690 | 700 | Regional |
| R-10a | 04/24/13 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 04/23/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 04/22/13 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 04/21/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 04/20/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 04/19/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 04/18/13 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 04/17/13 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 04/16/13 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 04/15/13 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 04/14/13 | 5738.74 | Transducer | 690 | 700 | Regional |
| R-10a | 04/13/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 04/12/13 | 5738.68 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 04/11/13 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 04/10/13 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 04/09/13 | 5738.85 | Transducer | 690 | 700 | Regional |
| R-10a | 04/08/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 04/07/13 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 04/06/13 | 5738.56 | Transducer | 690 | 700 | Regional |
| R-10a | 04/05/13 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 04/04/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 04/03/13 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 04/02/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 04/01/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 03/31/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 03/30/13 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 03/29/13 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 03/28/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 03/27/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 03/26/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 03/25/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 03/24/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 03/23/13 | 5738.76 | Transducer | 690 | 700 | Regional |
| R-10a | 03/22/13 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 03/21/13 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 03/20/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 03/19/13 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 03/18/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 03/17/13 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 03/16/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 03/15/13 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 03/14/13 | 5738.4 | Transducer | 690 | 700 | Regional |
| R-10a | 03/13/13 | 5738.44 | Transducer | 690 | 700 | Regional |
| R-10a | 03/12/13 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 03/11/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 03/10/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 03/09/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 03/08/13 | 5738.54 | Transducer | 690 | 700 | Regional |
| R-10a | 03/07/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 03/06/13 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 03/05/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 03/04/13 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 03/03/13 | 5738.39 | Transducer | 690 | 700 | Regional |
| R-10a | 03/02/13 | 5738.38 | Transducer | 690 | 700 | Regional |
| R-10a | 03/01/13 | 5738.45 | Transducer | 690 | 700 | Regional |
| R-10a | 02/28/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 02/27/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 02/26/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 02/25/13 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 02/24/13 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 02/23/13 | 5738.72 | Transducer | 690 | 700 | Regional |
| R-10a | 02/22/13 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 02/21/13 | 5738.91 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 02/20/13 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 02/19/13 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 02/18/13 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 02/17/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 02/16/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 02/15/13 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 02/14/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 02/13/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 02/12/13 | 5738.78 | Transducer | 690 | 700 | Regional |
| R-10a | 02/12/13 | 5738.72 | Transducer | 690 | 700 | Regional |
| R-10a | 02/11/13 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 02/10/13 | 5738.83 | Transducer | 690 | 700 | Regional |
| R-10a | 02/09/13 | 5738.74 | Transducer | 690 | 700 | Regional |
| R-10a | 02/08/13 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 02/07/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 02/06/13 | 5738.66 | Transducer | 690 | 700 | Regional |
| R-10a | 02/05/13 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 02/04/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 02/03/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 02/02/13 | 5738.57 | Transducer | 690 | 700 | Regional |
| R-10a | 02/01/13 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 01/31/13 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 01/30/13 | 5738.85 | Transducer | 690 | 700 | Regional |
| R-10a | 01/29/13 | 5738.85 | Transducer | 690 | 700 | Regional |
| R-10a | 01/28/13 | 5738.72 | Transducer | 690 | 700 | Regional |
| R-10a | 01/27/13 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 01/26/13 | 5738.53 | Transducer | 690 | 700 | Regional |
| R-10a | 01/25/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 01/24/13 | 5738.48 | Transducer | 690 | 700 | Regional |
| R-10a | 01/23/13 | 5738.49 | Transducer | 690 | 700 | Regional |
| R-10a | 01/22/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 01/21/13 | 5738.5 | Transducer | 690 | 700 | Regional |
| R-10a | 01/20/13 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 01/19/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 01/18/13 | 5738.47 | Transducer | 690 | 700 | Regional |
| R-10a | 01/17/13 | 5738.52 | Transducer | 690 | 700 | Regional |
| R-10a | 01/16/13 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 01/15/13 | 5738.78 | Transducer | 690 | 700 | Regional |
| R-10a | 01/14/13 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 01/13/13 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 01/12/13 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 01/11/13 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 01/10/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 01/09/13 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 01/08/13 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 01/07/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 01/06/13 | 5738.51 | Transducer | 690 | 700 | Regional |
| R-10a | 01/05/13 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 01/04/13 | 5738.58 | Transducer | 690 | 700 | Regional |
| R-10a | 01/03/13 | 5738.64 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 01/02/13 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 01/01/13 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 12/31/12 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 12/30/12 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 12/29/12 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 12/28/12 | 5738.86 | Transducer | 690 | 700 | Regional |
| R-10a | 12/27/12 | 5738.87 | Transducer | 690 | 700 | Regional |
| R-10a | 12/26/12 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 12/25/12 | 5738.87 | Transducer | 690 | 700 | Regional |
| R-10a | 12/24/12 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 12/23/12 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 12/22/12 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 12/21/12 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 12/20/12 | 5738.78 | Transducer | 690 | 700 | Regional |
| R-10a | 12/19/12 | 5738.96 | Transducer | 690 | 700 | Regional |
| R-10a | 12/18/12 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 12/17/12 | 5738.83 | Transducer | 690 | 700 | Regional |
| R-10a | 12/16/12 | 5738.9 | Transducer | 690 | 700 | Regional |
| R-10a | 12/15/12 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 12/14/12 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 12/13/12 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 12/12/12 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 12/11/12 | 5738.82 | Transducer | 690 | 700 | Regional |
| R-10a | 12/10/12 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 12/09/12 | 5738.91 | Transducer | 690 | 700 | Regional |
| R-10a | 12/08/12 | 5738.86 | Transducer | 690 | 700 | Regional |
| R-10a | 12/07/12 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 12/06/12 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 12/05/12 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 12/04/12 | 5738.71 | Transducer | 690 | 700 | Regional |
| R-10a | 12/03/12 | 5738.76 | Transducer | 690 | 700 | Regional |
| R-10a | 12/02/12 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 12/01/12 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 11/30/12 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 11/29/12 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 11/28/12 | 5738.59 | Transducer | 690 | 700 | Regional |
| R-10a | 11/27/12 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 11/26/12 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 11/25/12 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 11/24/12 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 11/23/12 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 11/22/12 | 5738.68 | Transducer | 690 | 700 | Regional |
| R-10a | 11/21/12 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 11/20/12 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 11/19/12 | 5738.65 | Transducer | 690 | 700 | Regional |
| R-10a | 11/18/12 | 5738.66 | Transducer | 690 | 700 | Regional |
| R-10a | 11/17/12 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 11/16/12 | 5738.55 | Transducer | 690 | 700 | Regional |
| R-10a | 11/15/12 | 5738.6 | Transducer | 690 | 700 | Regional |
| R-10a | 11/14/12 | 5738.59 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 11/13/12 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 11/12/12 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 11/11/12 | 5738.9 | Transducer | 690 | 700 | Regional |
| R-10a | 11/10/12 | 5738.89 | Transducer | 690 | 700 | Regional |
| R-10a | 11/09/12 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 11/08/12 | 5738.7 | Transducer | 690 | 700 | Regional |
| R-10a | 11/07/12 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 11/06/12 | 5738.62 | Transducer | 690 | 700 | Regional |
| R-10a | 11/05/12 | 5738.61 | Transducer | 690 | 700 | Regional |
| R-10a | 11/04/12 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 11/03/12 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 11/02/12 | 5738.69 | Transducer | 690 | 700 | Regional |
| R-10a | 11/01/12 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 10/31/12 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 10/30/12 | 5738.63 | Transducer | 690 | 700 | Regional |
| R-10a | 10/29/12 | 5738.64 | Transducer | 690 | 700 | Regional |
| R-10a | 10/28/12 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 10/27/12 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 10/26/12 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 10/25/12 | 5738.85 | Transducer | 690 | 700 | Regional |
| R-10a | 10/24/12 | 5738.83 | Transducer | 690 | 700 | Regional |
| R-10a | 10/23/12 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 10/22/12 | 5738.86 | Transducer | 690 | 700 | Regional |
| R-10a | 10/21/12 | 5738.86 | Transducer | 690 | 700 | Regional |
| R-10a | 10/20/12 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 10/19/12 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 10/18/12 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 10/17/12 | 5738.85 | Transducer | 690 | 700 | Regional |
| R-10a | 10/16/12 | 5738.74 | Transducer | 690 | 700 | Regional |
| R-10a | 10/15/12 | 5738.67 | Transducer | 690 | 700 | Regional |
| R-10a | 10/14/12 | 5738.73 | Transducer | 690 | 700 | Regional |
| R-10a | 10/13/12 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 10/12/12 | 5738.78 | Transducer | 690 | 700 | Regional |
| R-10a | 10/11/12 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 10/10/12 | 5738.82 | Transducer | 690 | 700 | Regional |
| R-10a | 10/09/12 | 5738.86 | Transducer | 690 | 700 | Regional |
| R-10a | 10/08/12 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 10/07/12 | 5738.83 | Transducer | 690 | 700 | Regional |
| R-10a | 10/06/12 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 10/05/12 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 10/04/12 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 10/03/12 | 5738.82 | Transducer | 690 | 700 | Regional |
| R-10a | 10/02/12 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 10/01/12 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 09/30/12 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 09/29/12 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 09/28/12 | 5738.81 | Transducer | 690 | 700 | Regional |
| R-10a | 09/27/12 | 5738.83 | Transducer | 690 | 700 | Regional |
| R-10a | 09/26/12 | 5738.86 | Transducer | 690 | 700 | Regional |
| R-10a | 09/25/12 | 5738.81 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 09/24/12 | 5738.78 | Transducer | 690 | 700 | Regional |
| R-10a | 09/23/12 | 5738.78 | Transducer | 690 | 700 | Regional |
| R-10a | 09/22/12 | 5738.8 | Transducer | 690 | 700 | Regional |
| R-10a | 09/21/12 | 5738.79 | Transducer | 690 | 700 | Regional |
| R-10a | 09/20/12 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 09/19/12 | 5738.76 | Transducer | 690 | 700 | Regional |
| R-10a | 09/18/12 | 5738.743 | Transducer | 690 | 700 | Regional |
| R-10a | 09/18/12 | 5738.76 | Transducer | 690 | 700 | Regional |
| R-10a | 09/17/12 | 5738.779 | Transducer | 690 | 700 | Regional |
| R-10a | 09/16/12 | 5738.699 | Transducer | 690 | 700 | Regional |
| R-10a | 09/15/12 | 5738.637 | Transducer | 690 | 700 | Regional |
| R-10a | 09/14/12 | 5738.654 | Transducer | 690 | 700 | Regional |
| R-10a | 09/13/12 | 5738.78 | Transducer | 690 | 700 | Regional |
| R-10a | 09/12/12 | 5738.823 | Transducer | 690 | 700 | Regional |
| R-10a | 09/11/12 | 5738.803 | Transducer | 690 | 700 | Regional |
| R-10a | 09/10/12 | 5738.75 | Transducer | 690 | 700 | Regional |
| R-10a | 09/09/12 | 5738.721 | Transducer | 690 | 700 | Regional |
| R-10a | 09/08/12 | 5738.763 | Transducer | 690 | 700 | Regional |
| R-10a | 09/07/12 | 5738.84 | Transducer | 690 | 700 | Regional |
| R-10a | 09/06/12 | 5738.811 | Transducer | 690 | 700 | Regional |
| R-10a | 09/05/12 | 5738.812 | Transducer | 690 | 700 | Regional |
| R-10a | 09/04/12 | 5738.786 | Transducer | 690 | 700 | Regional |
| R-10a | 09/03/12 | 5738.785 | Transducer | 690 | 700 | Regional |
| R-10a | 09/02/12 | 5738.763 | Transducer | 690 | 700 | Regional |
| R-10a | 09/01/12 | 5738.77 | Transducer | 690 | 700 | Regional |
| R-10a | 08/31/12 | 5738.784 | Transducer | 690 | 700 | Regional |
| R-10a | 08/30/12 | 5738.767 | Transducer | 690 | 700 | Regional |
| R-10a | 08/29/12 | 5738.725 | Transducer | 690 | 700 | Regional |
| R-10a | 08/28/12 | 5738.721 | Transducer | 690 | 700 | Regional |
| R-10a | 08/27/12 | 5738.78 | Transducer | 690 | 700 | Regional |
| R-10a | 08/26/12 | 5738.878 | Transducer | 690 | 700 | Regional |
| R-10a | 08/25/12 | 5738.923 | Transducer | 690 | 700 | Regional |
| R-10a | 08/24/12 | 5738.881 | Transducer | 690 | 700 | Regional |
| R-10a | 08/23/12 | 5738.837 | Transducer | 690 | 700 | Regional |
| R-10a | 08/22/12 | 5738.786 | Transducer | 690 | 700 | Regional |
| R-10a | 08/21/12 | 5738.809 | Transducer | 690 | 700 | Regional |
| R-10a | 08/20/12 | 5738.801 | Transducer | 690 | 700 | Regional |
| R-10a | 08/19/12 | 5738.803 | Transducer | 690 | 700 | Regional |
| R-10a | 08/18/12 | 5738.782 | Transducer | 690 | 700 | Regional |
| R-10a | 08/17/12 | 5738.774 | Transducer | 690 | 700 | Regional |
| R-10a | 08/16/12 | 5738.838 | Transducer | 690 | 700 | Regional |
| R-10a | 08/15/12 | 5738.834 | Transducer | 690 | 700 | Regional |
| R-10a | 08/14/12 | 5738.777 | Transducer | 690 | 700 | Regional |
| R-10a | 08/13/12 | 5738.737 | Transducer | 690 | 700 | Regional |
| R-10a | 08/12/12 | 5738.791 | Transducer | 690 | 700 | Regional |
| R-10a | 08/11/12 | 5738.749 | Transducer | 690 | 700 | Regional |
| R-10a | 08/10/12 | 5738.703 | Transducer | 690 | 700 | Regional |
| R-10a | 08/09/12 | 5738.676 | Transducer | 690 | 700 | Regional |
| R-10a | 08/08/12 | 5738.81 | Manual | 690 | 700 | Regional |
| R-10a | 08/08/12 | 5738.839 | Transducer | 690 | 700 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-10a | 08/07/12 | 5738.834 | Transducer | 690 | 700 | Regional |
| R-10a | 08/06/12 | 5738.774 | Transducer | 690 | 700 | Regional |
| R-10a | 08/05/12 | 5738.843 | Transducer | 690 | 700 | Regional |
| R-10a | 08/04/12 | 5738.938 | Transducer | 690 | 700 | Regional |
| R-10a | 08/03/12 | 5738.907 | Transducer | 690 | 700 | Regional |
| R-10a | 08/02/12 | 5738.884 | Transducer | 690 | 700 | Regional |
| R-10a | 08/01/12 | 5738.857 | Transducer | 690 | 700 | Regional |
| R-10a | 07/31/12 | 5738.874 | Transducer | 690 | 700 | Regional |
| R-10a | 07/30/12 | 5738.872 | Transducer | 690 | 700 | Regional |
| R-10a | 07/29/12 | 5738.846 | Transducer | 690 | 700 | Regional |
| R-10a | 07/28/12 | 5738.865 | Transducer | 690 | 700 | Regional |
| R-10a | 07/27/12 | 5738.908 | Transducer | 690 | 700 | Regional |
| R-10a | 07/26/12 | 5738.967 | Transducer | 690 | 700 | Regional |
| R-10a | 07/25/12 | 5738.923 | Transducer | 690 | 700 | Regional |
| R-10a | 07/24/12 | 5738.846 | Transducer | 690 | 700 | Regional |
| R-10a | 07/23/12 | 5738.822 | Transducer | 690 | 700 | Regional |
| R-10a | 07/22/12 | 5738.826 | Transducer | 690 | 700 | Regional |
| R-10a | 07/21/12 | 5738.799 | Transducer | 690 | 700 | Regional |
| R-10a | 07/20/12 | 5738.803 | Transducer | 690 | 700 | Regional |
| R-10a | 07/19/12 | 5738.855 | Transducer | 690 | 700 | Regional |
| R-10a | 07/18/12 | 5738.918 | Transducer | 690 | 700 | Regional |
| R-10a | 07/17/12 | 5738.928 | Transducer | 690 | 700 | Regional |
| R-10a | 07/16/12 | 5738.893 | Transducer | 690 | 700 | Regional |
| R-10a | 07/15/12 | 5738.861 | Transducer | 690 | 700 | Regional |
| R-10a | 07/14/12 | 5738.851 | Transducer | 690 | 700 | Regional |
| R-10a | 07/13/12 | 5738.847 | Transducer | 690 | 700 | Regional |
| R-10a | 07/12/12 | 5738.833 | Transducer | 690 | 700 | Regional |
| R-10a | 07/11/12 | 5738.808 | Transducer | 690 | 700 | Regional |
| R-10a | 07/10/12 | 5738.817 | Transducer | 690 | 700 | Regional |
| R-10a | 07/09/12 | 5738.824 | Transducer | 690 | 700 | Regional |
| R-34 | 09/08/14 | 5831.2 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/07/14 | 5831.11 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/06/14 | 5831.12 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/05/14 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/04/14 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/03/14 | 5831.33 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/02/14 | 5831.33 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/01/14 | 5831.42 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/31/14 | 5831.41 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/30/14 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/29/14 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/28/14 | 5831.2 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/27/14 | 5831.18 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/26/14 | 5831.22 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/25/14 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/24/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/23/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/22/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/21/14 | 5831.37 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/20/14 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 08/19/14 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/18/14 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/17/14 | 5831.33 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/16/14 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/15/14 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/14/14 | 5831.27 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/13/14 | 5831.25 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/12/14 | 5831.13 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/11/14 | 5831.15 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/10/14 | 5831.27 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/09/14 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/08/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/07/14 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/06/14 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/05/14 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/04/14 | 5831.24 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/03/14 | 5831.21 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/02/14 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/01/14 | 5831.28 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/31/14 | 5831.33 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/30/14 | 5831.33 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/29/14 | 5831.2 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/28/14 | 5831.11 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/27/14 | 5831.26 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/26/14 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/25/14 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/24/14 | 5831.14 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/23/14 | 5831.21 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/22/14 | 5831.25 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/21/14 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/20/14 | 5831.3 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/19/14 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/18/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/17/14 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/16/14 | 5831.28 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/15/14 | 5831.2 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/14/14 | 5831.13 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/13/14 | 5831.25 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/12/14 | 5831.27 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/11/14 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/10/14 | 5831.28 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/09/14 | 5831.19 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/08/14 | 5831.23 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/07/14 | 5831.22 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/06/14 | 5831.15 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/05/14 | 5831.1 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/04/14 | 5831.14 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/03/14 | 5831.1 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/02/14 | 5831.18 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/01/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 06/30/14 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/29/14 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/28/14 | 5831.5 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/27/14 | 5831.44 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/26/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/25/14 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/24/14 | 5831.28 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/23/14 | 5831.37 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/22/14 | 5831.34 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/21/14 | 5831.26 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/20/14 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/19/14 | 5831.42 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/18/14 | 5831.44 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/17/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/16/14 | 5831.44 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/15/14 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/14/14 | 5831.5 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/13/14 | 5831.34 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/12/14 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/11/14 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/10/14 | 5831.37 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/09/14 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/08/14 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/07/14 | 5831.5 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/06/14 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/05/14 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/04/14 | 5831.53 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/03/14 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/02/14 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/01/14 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/31/14 | 5831.41 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/30/14 | 5831.33 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/29/14 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/28/14 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/27/14 | 5831.34 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/26/14 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/25/14 | 5831.5 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/24/14 | 5831.42 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/23/14 | 5831.35 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/22/14 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/21/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/20/14 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/19/14 | 5831.57 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/18/14 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/17/14 | 5831.44 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/16/14 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/15/14 | 5831.25 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/14/14 | 5831.15 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/13/14 | 5831.3 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/12/14 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 05/11/14 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/10/14 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/09/14 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/08/14 | 5831.63 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/07/14 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/06/14 | 5831.65 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/05/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/04/14 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/03/14 | 5831.48 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/02/14 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/01/14 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/30/14 | 5831.35 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/29/14 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/28/14 | 5831.74 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/27/14 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/26/14 | 5831.67 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/25/14 | 5831.5 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/24/14 | 5831.46 | Manual | 883.7 | 906.6 | Regional |
| R-34 | 04/24/14 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/23/14 | 5831.68 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/22/14 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/21/14 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/20/14 | 5831.41 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/19/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/18/14 | 5831.33 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/17/14 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/16/14 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/15/14 | 5831.34 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/14/14 | 5831.62 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/13/14 | 5831.74 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/12/14 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/11/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/10/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/09/14 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/08/14 | 5831.25 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/07/14 | 5831.56 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/06/14 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/05/14 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/04/14 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/03/14 | 5831.74 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/02/14 | 5831.71 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/01/14 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/31/14 | 5831.63 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/30/14 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/29/14 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/28/14 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/27/14 | 5831.9 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/26/14 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/25/14 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/24/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 03/23/14 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/22/14 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/21/14 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/20/14 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/19/14 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/18/14 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/17/14 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/16/14 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/15/14 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/14/14 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/13/14 | 5831.35 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/12/14 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/11/14 | 5831.63 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/10/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/09/14 | 5831.27 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/08/14 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/07/14 | 5831.59 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/06/14 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/05/14 | 5831.61 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/04/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/03/14 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/02/14 | 5831.65 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/01/14 | 5831.59 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/28/14 | 5831.73 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/27/14 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/26/14 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/25/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/24/14 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/23/14 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/22/14 | 5831.59 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/21/14 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/20/14 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/19/14 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/18/14 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/17/14 | 5831.48 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/16/14 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/15/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/14/14 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/13/14 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/12/14 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/11/14 | 5831.53 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/10/14 | 5831.62 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/10/14 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/09/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/08/14 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/07/14 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/06/14 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/05/14 | 5831.65 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/04/14 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/03/14 | 5831.62 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 02/02/14 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/01/14 | 5831.87 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/31/14 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/30/14 | 5831.66 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/29/14 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/28/14 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/27/14 | 5831.67 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/26/14 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/25/14 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/24/14 | 5831.27 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/23/14 | 5831.67 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/22/14 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/21/14 | 5831.27 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/20/14 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/19/14 | 5831.34 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/18/14 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/17/14 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/16/14 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/15/14 | 5831.2 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/14/14 | 5831.37 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/13/14 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/12/14 | 5831.59 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/11/14 | 5831.59 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/10/14 | 5831.69 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/09/14 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/08/14 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/07/14 | 5831.35 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/06/14 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/05/14 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/04/14 | 5831.68 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/03/14 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/02/14 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/01/14 | 5831.41 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/31/13 | 5831.33 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/30/13 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/29/13 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/28/13 | 5831.42 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/27/13 | 5831.24 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/26/13 | 5831.2 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/25/13 | 5831.3 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/24/13 | 5831.25 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/23/13 | 5831.35 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/22/13 | 5831.82 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/21/13 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/20/13 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/19/13 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/18/13 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/17/13 | 5831.24 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/16/13 | 5831.2 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/15/13 | 5831.24 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 12/14/13 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/13/13 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/12/13 | 5831.08 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/11/13 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/10/13 | 5831.26 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/09/13 | 5831.57 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/08/13 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/07/13 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/06/13 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/05/13 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/04/13 | 5831.86 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/03/13 | 5831.66 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/02/13 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/01/13 | 5831.37 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/30/13 | 5831.35 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/29/13 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/28/13 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/27/13 | 5831.21 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/26/13 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/25/13 | 5831.57 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/24/13 | 5831.22 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/23/13 | 5831.21 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/22/13 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/21/13 | 5831.63 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/20/13 | 5831.56 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/19/13 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/18/13 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/17/13 | 5831.71 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/16/13 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/15/13 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/14/13 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/13/13 | 5831.1 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/12/13 | 5831.19 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/11/13 | 5831.3 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/10/13 | 5831.26 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/09/13 | 5831.41 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/08/13 | 5831.27 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/07/13 | 5831.08 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/06/13 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/05/13 | 5831.66 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/04/13 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/03/13 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/02/13 | 5831.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/01/13 | 5831.48 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/31/13 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/30/13 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/29/13 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/28/13 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/27/13 | 5831.32 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/26/13 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 10/25/13 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/24/13 | 5831.38 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/23/13 | 5831.34 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/22/13 | 5831.36 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/21/13 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/20/13 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/19/13 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/18/13 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/17/13 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/16/13 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/15/13 | 5831.48 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/14/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/13/13 | 5831.34 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/12/13 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/11/13 | 5831.56 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/10/13 | 5831.63 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/09/13 | 5831.61 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/08/13 | 5831.37 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/07/13 | 5831.3 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/06/13 | 5831.31 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/05/13 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/04/13 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/03/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/02/13 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/01/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/30/13 | 5831.43 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/29/13 | 5831.34 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/28/13 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/27/13 | 5831.68 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/26/13 | 5831.7 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/25/13 | 5831.53 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/24/13 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/23/13 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/22/13 | 5831.59 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/21/13 | 5831.53 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/20/13 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/19/13 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/18/13 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/17/13 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/16/13 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/15/13 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/14/13 | 5831.67 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/13/13 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/12/13 | 5831.5 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/11/13 | 5831.62 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/10/13 | 5831.66 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/09/13 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/08/13 | 5831.48 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/07/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/06/13 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 09/05/13 | 5831.39 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/04/13 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/03/13 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/02/13 | 5831.47 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/01/13 | 5831.62 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/31/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/30/13 | 5831.46 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/29/13 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/28/13 | 5831.51 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/27/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/26/13 | 5831.4 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/25/13 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/24/13 | 5831.53 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/23/13 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/22/13 | 5831.48 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/21/13 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/20/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/19/13 | 5831.56 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/18/13 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/17/13 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/16/13 | 5831.54 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/15/13 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/14/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/13/13 | 5831.53 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/12/13 | 5831.57 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/11/13 | 5831.48 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/10/13 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/09/13 | 5831.55 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/08/13 | 5831.62 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/07/13 | 5831.59 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/06/13 | 5831.608 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/06/13 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/05/13 | 5831.486 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/04/13 | 5831.531 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/03/13 | 5831.544 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/02/13 | 5831.62 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/01/13 | 5831.467 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/31/13 | 5831.526 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/30/13 | 5831.6 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/29/13 | 5831.718 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/28/13 | 5831.622 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/27/13 | 5831.443 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/26/13 | 5831.439 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/25/13 | 5831.535 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/24/13 | 5831.576 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/23/13 | 5831.635 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/22/13 | 5831.61 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/21/13 | 5831.675 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/20/13 | 5831.59 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/19/13 | 5831.577 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 07/18/13 | 5831.45 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/17/13 | 5831.532 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/16/13 | 5831.579 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/15/13 | 5831.637 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/14/13 | 5831.582 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/13/13 | 5831.616 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/12/13 | 5831.637 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/11/13 | 5831.584 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/10/13 | 5831.491 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/09/13 | 5831.525 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/08/13 | 5831.62 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/07/13 | 5831.598 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/06/13 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/05/13 | 5831.66 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/04/13 | 5831.71 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/03/13 | 5831.5 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/02/13 | 5831.52 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/01/13 | 5831.512 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/30/13 | 5831.562 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/29/13 | 5831.412 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/28/13 | 5831.511 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/27/13 | 5831.491 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/26/13 | 5831.631 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/25/13 | 5831.717 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/24/13 | 5831.722 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/23/13 | 5831.729 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/22/13 | 5831.671 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/21/13 | 5831.637 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/20/13 | 5831.696 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/19/13 | 5831.689 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/18/13 | 5831.623 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/17/13 | 5831.627 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/16/13 | 5831.621 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/15/13 | 5831.649 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/14/13 | 5831.589 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/13/13 | 5831.584 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/12/13 | 5831.625 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/11/13 | 5831.662 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/10/13 | 5831.63 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/09/13 | 5831.675 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/08/13 | 5831.725 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/07/13 | 5831.571 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/06/13 | 5831.641 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/05/13 | 5831.734 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/04/13 | 5831.695 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/03/13 | 5831.671 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/02/13 | 5831.594 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 06/01/13 | 5831.688 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/31/13 | 5831.79 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/30/13 | 5831.98 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 05/30/13 | 5831.821 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/29/13 | 5832.01 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/28/13 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/27/13 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/26/13 | 5831.78 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/25/13 | 5831.7 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/24/13 | 5831.74 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/23/13 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/22/13 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/21/13 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/20/13 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/19/13 | 5831.99 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/18/13 | 5831.86 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/17/13 | 5831.95 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/16/13 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/15/13 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/14/13 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/13/13 | 5831.67 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/12/13 | 5831.58 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/11/13 | 5831.56 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/10/13 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/09/13 | 5831.87 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/08/13 | 5831.86 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/07/13 | 5831.85 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/06/13 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/05/13 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/04/13 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/03/13 | 5831.49 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/02/13 | 5831.66 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 05/01/13 | 5832.07 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/30/13 | 5831.99 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/29/13 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/28/13 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/27/13 | 5831.68 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/26/13 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/25/13 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/24/13 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/23/13 | 5831.95 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/22/13 | 5831.82 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/21/13 | 5831.85 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/20/13 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/19/13 | 5831.69 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/18/13 | 5831.94 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/17/13 | 5832.06 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/16/13 | 5832.12 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/15/13 | 5832.16 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/14/13 | 5832.19 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/13/13 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/12/13 | 5831.96 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/11/13 | 5831.98 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 04/10/13 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/10/13 | 5832.07 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/09/13 | 5832.41 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/08/13 | 5832.15 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/07/13 | 5832.06 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/06/13 | 5831.98 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/05/13 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/04/13 | 5831.87 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/03/13 | 5831.93 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/02/13 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 04/01/13 | 5831.95 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/31/13 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/30/13 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/29/13 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/28/13 | 5831.89 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/27/13 | 5831.95 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/26/13 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/25/13 | 5831.93 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/24/13 | 5831.99 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/23/13 | 5832.21 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/22/13 | 5832.19 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/21/13 | 5832.03 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/20/13 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/19/13 | 5832.01 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/18/13 | 5832.16 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/17/13 | 5832.1 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/16/13 | 5831.96 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/15/13 | 5831.7 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/14/13 | 5831.65 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/13/13 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/12/13 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/11/13 | 5831.85 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/10/13 | 5832.05 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/09/13 | 5832.15 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/08/13 | 5832.01 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/07/13 | 5831.89 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/06/13 | 5831.75 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/05/13 | 5831.85 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/04/13 | 5832.05 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/03/13 | 5831.69 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/02/13 | 5831.65 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 03/01/13 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/28/13 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/27/13 | 5831.87 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/26/13 | 5832.02 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/25/13 | 5832.09 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/24/13 | 5832.14 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/23/13 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/22/13 | 5832.17 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/21/13 | 5832.38 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 02/20/13 | 5832.23 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/19/13 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/18/13 | 5832.22 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/17/13 | 5831.86 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/16/13 | 5831.65 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/15/13 | 5831.86 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/14/13 | 5831.95 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/13/13 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/12/13 | 5832.08 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/11/13 | 5832.1 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/10/13 | 5832.21 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/09/13 | 5832.12 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/08/13 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/07/13 | 5832.04 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/06/13 | 5832.03 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/05/13 | 5832.03 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/04/13 | 5832.04 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/03/13 | 5831.7 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/02/13 | 5831.75 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 02/01/13 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/31/13 | 5831.92 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/30/13 | 5832.19 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/29/13 | 5832.29 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/28/13 | 5832.07 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/27/13 | 5832.05 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/26/13 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/25/13 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/24/13 | 5831.69 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/23/13 | 5831.7 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/22/13 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/21/13 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/20/13 | 5831.67 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/19/13 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/18/13 | 5831.57 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/17/13 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/16/13 | 5831.69 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/15/13 | 5831.95 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/14/13 | 5831.99 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/13/13 | 5832.01 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/12/13 | 5832.14 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/11/13 | 5832.17 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/10/13 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/09/13 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/08/13 | 5832.04 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/07/13 | 5831.82 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/06/13 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/05/13 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/04/13 | 5831.71 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/03/13 | 5831.82 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 01/02/13 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 01/01/13 | 5832 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/31/12 | 5832.1 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/30/12 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/29/12 | 5831.78 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/28/12 | 5832.14 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/27/12 | 5832.22 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/26/12 | 5831.92 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/25/12 | 5832.3 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/24/12 | 5831.96 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/23/12 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/22/12 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/21/12 | 5831.57 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/20/12 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/19/12 | 5832.28 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/18/12 | 5832.04 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/17/12 | 5831.95 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/16/12 | 5832.17 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/15/12 | 5832.03 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/14/12 | 5832.04 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/13/12 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/12/12 | 5831.98 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/11/12 | 5832.01 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/10/12 | 5832.02 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/10/12 | 5831.93 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/09/12 | 5832.15 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/08/12 | 5832.09 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/07/12 | 5832.17 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/06/12 | 5832.04 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/05/12 | 5831.78 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/04/12 | 5831.92 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/03/12 | 5832.05 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/02/12 | 5831.87 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 12/01/12 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/30/12 | 5831.9 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/29/12 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/28/12 | 5831.73 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/27/12 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/26/12 | 5832.02 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/25/12 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/24/12 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/23/12 | 5831.73 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/22/12 | 5831.96 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/21/12 | 5831.78 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/20/12 | 5831.79 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/19/12 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/18/12 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/17/12 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/16/12 | 5831.64 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/15/12 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/14/12 | 5831.73 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 11/13/12 | 5831.66 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/12/12 | 5831.75 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/11/12 | 5832.14 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/10/12 | 5832.21 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/09/12 | 5832.05 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/08/12 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/07/12 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/06/12 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/05/12 | 5831.72 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/04/12 | 5831.73 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/03/12 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/02/12 | 5831.85 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 11/01/12 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/31/12 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/30/12 | 5831.77 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/29/12 | 5831.79 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/28/12 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/27/12 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/26/12 | 5831.8 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/25/12 | 5832.05 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/24/12 | 5831.94 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/23/12 | 5831.99 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/22/12 | 5832.04 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/21/12 | 5832.07 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/20/12 | 5831.98 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/19/12 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/18/12 | 5831.9 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/17/12 | 5832.04 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/16/12 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/15/12 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/14/12 | 5831.76 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/13/12 | 5831.94 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/12/12 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/11/12 | 5831.89 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/10/12 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/09/12 | 5831.94 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/08/12 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/07/12 | 5831.96 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/06/12 | 5831.93 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/05/12 | 5831.92 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/04/12 | 5831.87 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/03/12 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/02/12 | 5831.86 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 10/01/12 | 5831.9 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/30/12 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/29/12 | 5831.83 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/28/12 | 5831.92 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/27/12 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/26/12 | 5831.96 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/25/12 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 09/24/12 | 5831.88 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/23/12 | 5831.85 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/22/12 | 5831.91 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/21/12 | 5831.9 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/20/12 | 5831.982 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/20/12 | 5831.92 | Manual | 883.7 | 906.6 | Regional |
| R-34 | 09/20/12 | 5831.84 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/19/12 | 5831.993 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/18/12 | 5832 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/17/12 | 5832.107 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/16/12 | 5831.926 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/15/12 | 5831.81 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/14/12 | 5831.738 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/13/12 | 5831.889 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/12/12 | 5832.017 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/11/12 | 5832.032 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/10/12 | 5831.893 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/09/12 | 5831.884 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/08/12 | 5831.837 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/07/12 | 5832.038 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/06/12 | 5832.033 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/05/12 | 5832.033 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/04/12 | 5832.01 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/03/12 | 5831.969 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/02/12 | 5831.996 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 09/01/12 | 5831.97 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/31/12 | 5832.025 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/30/12 | 5831.997 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/29/12 | 5831.951 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/28/12 | 5831.916 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/27/12 | 5831.967 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/26/12 | 5832.116 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/25/12 | 5832.183 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/24/12 | 5832.112 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/23/12 | 5832.053 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/22/12 | 5832.008 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/21/12 | 5832.105 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/20/12 | 5832.017 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/19/12 | 5832.043 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/18/12 | 5831.996 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/17/12 | 5832.012 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/16/12 | 5832.158 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/15/12 | 5832.15 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/14/12 | 5832.021 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/13/12 | 5831.924 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/12/12 | 5832.114 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/11/12 | 5832.032 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/10/12 | 5831.976 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/09/12 | 5831.948 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/08/12 | 5832.044 | Transducer | 883.7 | 906.6 | Regional |

| Location | Date | Water Level (ft) | Method | Screen Interval (ft) | Top Depth (ft) | Zone |
|---|---|---|---|---|---|---|
| R-34 | 08/07/12 | 5832.03 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/06/12 | 5831.86 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/05/12 | 5831.924 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/04/12 | 5832.129 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/03/12 | 5832.007 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/02/12 | 5832.002 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 08/01/12 | 5832.018 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/31/12 | 5832.007 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/30/12 | 5832.062 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/29/12 | 5831.954 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/28/12 | 5832.02 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/27/12 | 5831.995 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/26/12 | 5832.123 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/25/12 | 5832.104 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/24/12 | 5832.001 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/23/12 | 5832.013 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/22/12 | 5831.941 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/21/12 | 5831.961 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/20/12 | 5831.908 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/19/12 | 5831.972 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/18/12 | 5832.145 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/17/12 | 5832.183 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/16/12 | 5832.147 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/15/12 | 5832.111 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/14/12 | 5832.049 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/13/12 | 5831.993 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/12/12 | 5831.98 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/11/12 | 5831.931 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/10/12 | 5831.937 | Transducer | 883.7 | 906.6 | Regional |
| R-34 | 07/09/12 | 5831.95 | Transducer | 883.7 | 906.6 | Regional |

# Appendix C

*Analytical Chemistry Results, Including Results from Previous Four Monitoring Events if Available*

The following pages provide lists of (1) acronyms, abbreviations, symbols, and various analytical codes; (2) analytical laboratory qualifier codes; and (3) secondary validation flag codes that may be used in Appendix C. Please note that these are comprehensive lists, and this periodic monitoring report may not include all of the terms in the lists.

## Acronyms and Abbreviations

| Acronym, Abbreviation, or Symbol | Description |
|---|---|
| **Miscellaneous** | |
| % | percent |
| %D | percent difference |
| %R | percent recovery |
| %RSD | percent relative standard deviation |
| < | Based on qualifiers, the result was a nondetection. |
| — | none |
| 4,4'-DDD | 4,4'-dichlorodiphenyldichloroethane |
| 4,4'-DDT | 4,4'-dichlorodiphenyltrichloroethane |
| BHC | benzene hexachloride |
| CB | chlorinated biphenyl |
| CCB | continuing calibration blank |
| CCV | continuing calibration verification |
| CLP | Control Laboratory Program |
| CRDL | contract-required detection limit |
| CRI | CDRL check standard |
| DCG | Derived Concentration Guide (DOE) |
| DDE | dichlorodiphenyldichloroethylene |
| DNX | dinitroso-RDX (or hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine) |
| DOE | Department of Energy (U.S.) |
| DQO | data quality objective |
| EPA | Environmental Protection Agency (U.S.) |
| GC | gas chromatography |
| GC/MS | gas chromatography/mass spectrometry |
| GFAA | graphite furnace atomic absorption |
| GFPC | gas-flow proportional counter |
| GW | groundwater |
| HH OO | Human Health—Organism Only (NMWQCC standard) |
| HMX | 1,3,5,7-tetranitro-1,3,5,7-tetrazocine |
| HPLC | high-pressure liquid chromatography |
| ICAL | initial calibration |
| ICPAES | inductively coupled plasma atomic (optical) emission spectroscopy |
| ICV | initial calibration verification |
| IDL | instrument detection limit |

## Acronyms and Abbreviations (continued)

| Acronym, Abbreviation, or Symbol | Description |
|---|---|
| **Miscellaneous (continued)** | |
| IS | internal standard |
| LAL | lower acceptance limit |
| LANL | Los Alamos National Laboratory |
| LCS | laboratory control sample |
| LLEE | low-level electrolytic extraction |
| LOC | level of chlorination |
| LSC | liquid scintillation counting |
| Lvl | level |
| MCL | maximum contaminant level (EPA) |
| MDA | minimum detectable activity |
| MDC | minimum detectable concentration |
| MDL | method detection limit |
| MNX | mononitroso-RDX (or hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine) |
| MS | matrix spike |
| MSD | matrix spike duplicate |
| NM | NMWQCC |
| NMED | New Mexico Environmental Department |
| NMWQCC | New Mexico Water Quality Control Commission |
| OPR | ongoing precision recovery |
| PCB | polychlorinated biphenyl |
| PCDD | polychlorinated dibenzo-p-dioxin |
| PCDF | polychlorinated dibenzofuran |
| PQL | practical quantitation limit |
| Prelim | preliminary |
| QC | quality control |
| RDX | hexahydro-1,3,5-trinitro-1,3,5-triazine |
| RF | response factor |
| RL | reporting limit |
| RPD | relative percent difference |
| RRF | relative response factor |
| RRT | relative retention time |
| RT | retention time |
| Scr | screening |
| SDG | sample delivery group |
| SMO | Sample Management Office |
| SSC | suspended sediment concentration |
| SU | standard unit |
| TCDD | tetrachlorodibenzo-p-dioxin |

## Acronyms and Abbreviations (continued)

| Acronym, Abbreviation, or Symbol | Description |
|---|---|
| **Miscellaneous (continued)** | |
| TCDF | tetrachlorodibenzofuran |
| TDS | total dissolved solids |
| TPH-DRO | total petroleum hydrocarbons—diesel range organics |
| TNX | trinitroso-RDX (or hexahydro-1,3,5-trinitroso-1,3,5-triazine) |
| TPU | total propagated uncertainty |
| UAL | upper acceptance limit |
| **Field Matrix Codes** | |
| W | water |
| WG | groundwater |
| WM | snowmelt |
| WP | persistent flow |
| WS | base flow |
| WT | storm runoff |
| **Field Prep Codes** | |
| F | filtered |
| UF | unfiltered |
| **Lab Sample Type Codes** | |
| CS | client sample |
| DL | dilution |
| DUP | duplicate |
| INIT | initial |
| RE | reanalysis |
| REDL | reanalysis dilution |
| REDP | reanalysis duplicate |
| RI | reissue |
| TRP | triplicate |
| **Field QC Type Codes** | |
| EQB | equipment rinsate blank |
| FB | field blank |
| FD | field duplicate |
| FR | field rinsate |
| FS | field split |
| FTB | field trip blank |
| FTR | field triplicate |
| INB | equipment blank taken during installation and not associated with a sampling event |
| ITB | trip blank taken during installation and not associated with a sampling event |
| NA | not applicable |
| PEB | performance evaluation blank |

## Acronyms and Abbreviations (continued)

| Acronym, Abbreviation, or Symbol | Description |
|---|---|
| **Field QC Type Codes (continued)** | |
| PEK | performance evaluation known |
| REG | regular |
| RES | resample |
| SS | special sampling event, data unique |
| SS-EQB | equipment blank of special sampling event, data unique |
| SS-FB | field blank of special sampling event, data unique |
| SS-FD | field duplicate of special sampling event, data unique |
| SS-FTB | field trip blank of special sampling event, data unique |
| **Analytical Suite Codes** | |
| DIOX/FUR, Diox/Fur | dioxins and furans |
| DRO | diesel range organics |
| Geninorg, GENINORG, General Chemistry | general inorganics |
| GRO | gasoline range organics |
| HERB | herbicides |
| HEXP | high explosives |
| INORGANIC | inorganics |
| ISOTOPE, Isotope | isotope ratios |
| LCMS/MS | liquid chromatography mass spectrometry/mass spectrometry |
| METALS, Metals | metals |
| PEST/PCB, PESTPCB | pesticides and PCBs |
| RAD, Rad | radiochemistry |
| SVOC, SVOA | semivolatile organic compounds |
| VOC, VOA | volatile organic compounds |
| **Detect Flag and Best Value Flag Codes** | |
| N | no |
| Y | yes |
| **Lab Codes** | |
| ALTC | Alta Analytical Laboratory, Inc., San Diego, CA |
| ARSL | American Radiation Services, Inc. |
| CFA | Cape Fear Analytical, LLC, Wilmington, NC |
| C-INC | Isotope and Nuclear Chemistry Division (LANL) |
| COAST | Coastal Science Laboratories, Austin, TX |
| CST | Chemical Sciences and Technology Division (LANL) |
| EES6 | Hydrology, Geochemistry, and Geology Group (LANL) |
| ESE | Environmental Sciences & Engineering, Inc., Gainesville, FL |
| FLD | measurement taken in field |
| GEL | General Engineering Laboratories, Inc. |

## Acronyms and Abbreviations (continued)

| Acronym, Abbreviation, or Symbol | Description |
|---|---|
| **Lab Codes (continued)** | |
| GELC | General Engineering Laboratories, Inc., Charleston, SC |
| GEO | Geochron Laboratories, Boston, MA |
| HENV | Health and Environmental Laboratory (Johnson Controls, Northern New Mexico) |
| HUFFMAN | Huffman Laboratories, Inc., Golden, CO |
| KA | KEMRON Environmental Services, Inc., Vienna, VA |
| LVLI | Lionville Laboratory, Inc., Philadelphia, PA |
| PARA | Paragon Analytics, Inc., Salt Lake City, UT |
| PEC | Pacific Ecorisk Laboratories, Fairfield, CA |
| QESL | Quanterra Environmental Services, St. Louis, MO |
| QST | QST Environmental, Newberry, FL |
| RECRAP | RECRA Labnet, Lionville, PA |
| RFWC | Roy F. Weston, Inc., West Chester, PA |
| SGSW | Paradigm Analytical Laboratories, Inc., Wilmington, NC |
| SILENS | Stable Isotope Laboratory, Woods Hole, MA |
| STL2, STR | Severn Trent Laboratories, Inc., Richland, WA (historical) |
| STLA | Severn Trent Laboratories, Inc., Los Angeles, CA |
| STSL | Severn Trent Laboratories, Inc., St. Louis, MO |
| SwRI | Southwest Research Institute, San Antonio, TX |
| UAZ | University of Arizona, Tucson |
| UIL | University of Illinois, Urbana-Champaign |
| UMTL | University of Miami Tritium Lab |

Note: A combination of analytical laboratory qualifier codes means that several codes apply.

**Analytical Laboratory Qualifier Codes**

| Code | Description |
|---|---|
| * | (Inorganic)—Duplicate analysis (relative percent difference [RPD]) not within control limits. |
| B | (Organic)—Analyte was present in the blank and the sample. (Inorganic) —Reported value was obtained from a reading that was less than the contract-required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL). |
| BJ | See B code and see J code. |
| BJP | See B code, see J code, and see P code. |
| BPX | (B) (Organic)—This analyte was detected in the associated laboratory method blank and the sample. (B) (Inorganic)—The result for this analyte was greater than the IDL but less than the CRDL. (P) (Pesticides/PCBs)—The quantitative results for this analyte between the primary and secondary gas chromatography (GC) columns were greater than 25% difference. (P) (SW-846 EPA Method 8310, High-Pressure Liquid Chromatography, [HPLC] Results)—The quantitative results for this analyte between the primary and secondary HPLC columns or primary and secondary HPLC detectors were greater than 40% difference. (X) (Organic/Inorganic)—The result for this analyte should be regarded as not detected. |
| D | The result for this analyte was reported from a dilution. |
| DJ | See D code and see J code. |
| DNA | Did not analyze because equipment was broken. |
| E | (Organic) Analyte exceeded the concentration range. (Inorganic) The serial dilution was exceeded. |
| E* | See E code and see * code. |
| EJ | See E code and see J code. |
| EJ* | See E code, see J code, and see * code. |
| EJN | (E) (Organic)—The result for this analyte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (inductively coupled plasma atomic [optical] emission spectroscopy [ICPAES])—The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (graphite furnace atomic absorption [GFAA])—The result for this analyte failed one or more Control Laboratory Program (CLP) acceptance criteria as explained in the case narrative. (J) (Organic/General Inorganics)—The result for this analyte was greater than the method detection limit (MDL) but less than the practical quantitation limit (PQL). (N) (Organic)—The reported analyte is a tentatively identified compound (TIC). (N) (Inorganic)—The result for this analyte in the matrix spike (MS) sample was outside acceptance criteria. |
| EN | See E code and see N code. |
| EN* | (E) (Organic)—The result for this analyte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICPAES)—The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA)—The result for this analyte failed one or more CLP acceptance criteria as explained in the case narrative. (N) (Organic)—The reported analyte is a TIC. (N) (Inorganic)—The result for this analyte in the MS sample was outside acceptance criteria. * (Inorganic)—The result for this analyte in the laboratory replicate analysis was outside acceptance criteria. |
| H | (Organic/Inorganic)—The required extraction or analysis holding time for this result was exceeded. |

**Analytical Laboratory Qualifier Codes (continued)**

| Code | Description |
|---|---|
| H* | (H) (Organic/Inorganic)—The required extraction or analysis holding time for this result was exceeded. * (Organic) and (Inorganic)—The result for this analyte in the laboratory control sample analysis was outside acceptance criteria. |
| HJ | See H code and see J code. |
| HJ* | (H) (Organic/Inorganic)—The required extraction or analysis holding time for this result was exceeded. (J) (Organic/General Inorganics)—The result for this analyte was greater than the MDL but less than the PQL. * (Inorganic)—The result for this analyte in the laboratory replicate analysis was outside acceptance criteria. |
| INS | (d15N)—The d15N of nitrate is a signature of the nitrate present in a sample. Therefore, nitrate has to be present to have a signature. A d15N value cannot be given to a blank because the blank does not have nitrate. This is different from most analytical methods, where a blank is run with the designator “nondetect” or “detected, but below detection limit.” |
| J | (Inorganic)—The associated numerical value is an estimated quantity. (Organic)—The associated numerical value is an estimated quantity. |
| J* | See J code and see * code. |
| JB | See J code and see B code |
| JN | See J code and see N code. |
| JN* | See J code, see N code, and see * code. |
| JP | See J code and see P code. |
| N | (Inorganic)—Spiked sample recovery was not within control limits. |
| N* | See N code and see * code. |
| N*E | See N code, see * code, and see E code. |
| NE | See N code and see E code. |
| P | Percent difference between the results on the two columns during the analysis differed by more than 40%. |
| PJ | See P code and see J code. |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or data exception report. |
| U | The material was analyzed for but was not detected above the level of the associated numeric value. |
| U* | See U code and see * code. |
| UD | See U code and see D code. |
| UE | See U code and see E code. |
| UE* | See U code, see E code, and see * code. |
| UEN | See U code, see E code, and see N code. |
| UH | See U code and see H code. |

## Analytical Laboratory Qualifier Codes (continued)

| | |
|---|---|
| UH* | (U) (Organic/Inorganic)—The result for this analyte was not detected at the specified reporting limit. (H) (Organic/Inorganic)—The required extraction or analysis holding time for this result was exceeded. * (Inorganic)—The result for this analyte in the laboratory replicate analysis was outside acceptance criteria. |
| UI | (Rad) Gamma spectroscopy result should be regarded as an uncertain identification. |
| UN | EPA flag (Inorganic)—Compound was analyzed for but was not detected. Spiked sample recovery was not within control limits. |
| UN* | EPA flag (Inorganic)—See U code, see N code, and see * code. |
| UUI | (Rad) Gamma spectroscopy result should be regarded as an uncertain identification, and the analytical lab assigned these gamma spectroscopy results as not detected. |
| X | The analytical laboratory suspects the result is a nondetect despite positive quantification results. |

## Secondary Validation Flag Codes

| Code | Description |
|---|---|
| A | The contractually required supporting documentation for this datum is absent. |
| I | The calculated sums are considered incomplete because of the lack of one or more congener results. |
| J | The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual. |
| J- | The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual with a potential negative bias. |
| J+ | The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual with a potential positive bias. |
| JN- | Presumptive evidence of the presence of the material is at an estimated quantity with a suspected negative bias. |
| JN+ | Presumptive evidence of the presence of the material is at an estimated quantity with a suspected positive bias. |
| N | There is presumptive evidence of the presence of the material. |
| NJ | (Organic) Analyte has been tentatively identified, and the associated numerical value is estimated based upon a 1:1 response factor to the nearest eluting internal standard. |
| NQ | No validation qualifier flag is associated with this result, and the analyte is classified as detected. |
| PM | Manual review of raw data is recommended to determine if the observed noncompliances with quality acceptance criteria adversely impact data use. |
| R | The reported sample result is classified as rejected because of serious noncompliances regarding quality control (QC) acceptance criteria. The presence or absence of the analyte cannot be verified based on routine validation alone. |
| U | The analyte is classified as not detected. |
| UJ | The analyte is classified as not detected, with an expectation that the reported result is more uncertain than usual. |

**Table C-1 San Ildefonso Pueblo General Surveillance Monitoring Group Previously Unreported Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.16 | — | — | 0.01 | SU | Y | H | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.98 | — | — | 0.01 | SU | Y | H | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.14 | — | — | 0.01 | SU | Y | H | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.13 | — | — | 0.01 | SU | Y | H | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.3 | — | — | 0.01 | SU | Y | H | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.29 | — | — | 0.01 | SU | Y | H | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.45 | — | — | 0.01 | SU | Y | H | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 71.6 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 67.8 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 76.1 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 71.2 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 69 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 75.3 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 69 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0358 | — | — | 0.017 | mg/L | Y | J | J | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0185 | — | — | 0.017 | mg/L | Y | J | J | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.0423 | — | — | 0.017 | mg/L | Y | J | U | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.0718 | — | — | 0.017 | mg/L | Y | — | U | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.0477 | — | — | 0.017 | mg/L | Y | J | U | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.106 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 6.74 | — | — | 1.7 | µg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | N | 5 | — | — | 1.7 | µg/L | Y | U | U | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | N | 2.13 | — | — | 1.7 | µg/L | Y | J | U | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | N | 5 | — | — | 1.7 | µg/L | Y | U | U | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | N | 5 | — | — | 1.7 | µg/L | Y | U | U | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Barium | Ba | Y | 24.4 | — | — | 1 | µg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 25.4 | — | — | 1 | µg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 25.4 | — | — | 1 | µg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 27.2 | — | — | 1 | µg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 27.8 | — | — | 1 | µg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 27.9 | — | — | 1 | µg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 25.8 | — | — | 1 | µg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Boron | B | Y | 16.4 | — | — | 15 | µg/L | Y | J | J | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 16.8 | — | — | 15 | µg/L | Y | J | J | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 16 | — | — | 15 | µg/L | Y | J | J | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 19.8 | — | — | 15 | µg/L | Y | J | J | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | N | 50 | — | — | 15 | µg/L | Y | U | U | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 17 | — | — | 15 | µg/L | Y | J | J | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 16.1 | — | — | 15 | µg/L | Y | J | J | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 16 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 15.7 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 16.4 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 16.9 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 16.9 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 16.9 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 16.3 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.72 | — | — | 0.067 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |

**Table C-1 San Ildefonso Pueblo General Surveillance Monitoring Group Previously Unreported Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.42 | — | — | 0.067 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.45 | — | — | 0.067 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.36 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.4 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.26 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.36 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 4.67 | — | — | 2 | µg/L | Y | J | J | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 4.14 | — | — | 2 | µg/L | Y | J | J | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 4.33 | — | — | 2 | µg/L | Y | J | J | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 4.34 | — | — | 2 | µg/L | Y | J | J | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 3.75 | — | — | 2 | µg/L | Y | J | J | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 4.61 | — | — | 2 | µg/L | Y | J | J | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 5.06 | — | — | 2 | µg/L | Y | J | J | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:335.4 | Cyanide (Total) | CN(TOTAL) | Y | 0.0168 | — | — | 0.00167 | mg/L | Y | — | J- | 2014-2723 | CAMO-14-45690 | GELC |
| R-34 | 883.700 | 11/10/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:335.4 | Cyanide (Total) | CN(TOTAL) | N | 0.005 | — | — | 0.0015 | mg/L | Y | U | U | 12-323 | CAMO-12-1532 | GELC |
| R-34 | 883.700 | 08/11/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:335.4 | Cyanide (Total) | CN(TOTAL) | N | 0.005 | — | — | 0.0015 | mg/L | Y | U | U | 11-3174 | CAMO-11-24650 | GELC |
| R-34 | 883.700 | 05/25/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:335.4 | Cyanide (Total) | CN(TOTAL) | N | 0.005 | — | — | 0.0015 | mg/L | Y | U | U | 11-2548 | CAMO-11-10771 | GELC |
| R-34 | 883.700 | 02/17/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:335.4 | Cyanide (Total) | CN(TOTAL) | N | 0.005 | — | — | 0.0017 | mg/L | Y | U | U | 11-1391 | CAMO-11-4670 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.329 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.297 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.305 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.309 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.319 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.342 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.34 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 55.2 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 54.2 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 56.3 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 58.1 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 57.7 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 58.2 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 56.8 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 3.69 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 3.65 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 3.73 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 3.87 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 3.77 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 3.9 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 3.9 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.13 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.16 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | N | 1.01 | — | — | 0.165 | µg/L | Y | — | U | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.02 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 0.972 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | N | 1.18 | — | — | 0.165 | µg/L | Y | — | U | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 0.716 | — | — | 0.5 | µg/L | Y | J | J | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | N | 2 | — | — | 0.5 | µg/L | Y | U | U | 2014-2723 | CAMO-14-45694 | GELC |

**Table C-1 San Ildefonso Pueblo General Surveillance Monitoring Group Previously Unreported Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | N | 2 | — | — | 0.5 | µg/L | Y | U | U | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 0.681 | — | — | 0.5 | µg/L | Y | J | J | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.05 | — | — | 0.5 | µg/L | Y | J | J | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.471 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.447 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.938 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.442 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.446 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.451 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.454 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.32 | — | — | 0.05 | µg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.32 | — | — | 0.05 | µg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.338 | — | — | 0.05 | µg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.35 | — | — | 0.05 | µg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 08/23/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.342 | — | — | 0.05 | µg/L | Y | — | NQ | 12-1515 | CAMO-12-21799 | GELC |
| R-34 | 883.700 | 08/23/12 | WG | F | INIT | FD | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.342 | — | — | 0.05 | µg/L | Y | — | NQ | 12-1515 | CAMO-12-21780 | GELC |
| R-34 | 883.700 | 05/30/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.351 | — | — | 0.05 | µg/L | Y | — | NQ | 12-1330 | CAMO-12-14035 | GELC |
| R-34 | 883.700 | 11/10/11 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.337 | — | — | 0.05 | µg/L | Y | — | NQ | 12-323 | CAMO-12-1533 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Potassium | K | Y | 1.73 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.58 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.73 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.77 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.82 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.87 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.78 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | Y | 2.08 | — | — | 1.5 | µg/L | Y | J | J | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | N | 5 | — | — | 1.5 | µg/L | Y | U | U | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | N | 5 | — | — | 1.5 | µg/L | Y | U | U | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | N | 5 | — | — | 1.5 | µg/L | Y | U | U | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | N | 5 | — | — | 1.5 | µg/L | Y | U | U | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 68 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 68.5 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 69.9 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 75 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 75.7 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 75 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 72.9 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Sodium | Na | Y | 10.7 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 11.3 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 11.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 11.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 11.1 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 10.8 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 12.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 153 | — | — | 1 | µS/cm | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 155 | — | — | 1 | µS/cm | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 157 | — | — | 1 | µS/cm | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |

**Table C-1 San Ildefonso Pueblo General Surveillance Monitoring Group Previously Unreported Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 155 | — | — | 1 | µS/cm | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 159 | — | — | 1 | µS/cm | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 153 | — | — | 1 | µS/cm | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 156 | — | — | 1 | µS/cm | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 56.8 | — | — | 1 | µg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 56.4 | — | — | 1 | µg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 55.4 | — | — | 1 | µg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 62.2 | — | — | 1 | µg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 61.9 | — | — | 1 | µg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 60.3 | — | — | 1 | µg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 61.2 | — | — | 1 | µg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 2.73 | — | — | 0.133 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 2.85 | — | — | 0.133 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 2.4 | — | — | 0.133 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 2.67 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 2.72 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 2.88 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 2.86 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 131 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 129 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 131 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 126 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 121 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 90 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 131 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.524 | — | — | 0.33 | mg/L | Y | J | J | 2014-3375 | CAMO-14-75544 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 1 | — | — | 0.33 | mg/L | Y | U | U | 2014-2789 | CAMO-14-53218 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 1 | — | — | 0.33 | mg/L | Y | U | U | 2014-2723 | CAMO-14-45690 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.491 | — | — | 0.33 | mg/L | Y | J | J | 2013-1224 | CAMO-13-37039 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.582 | — | — | 0.33 | mg/L | Y | J | J | 2013-855 | CAMO-13-30614 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.0199 | — | — | 0.017 | mg/L | Y | J | J | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.0358 | — | — | 0.017 | mg/L | Y | J | J | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.0294 | — | — | 0.017 | mg/L | Y | J | J | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.484 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.485 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.463 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.469 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.453 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.463 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.485 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 05/09/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Vanadium | V | Y | 6.61 | — | — | 1 | µg/L | Y | — | NQ | 2014-3375 | CAMO-14-75548 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 7.4 | — | — | 1 | µg/L | Y | — | NQ | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 6.51 | — | — | 1 | µg/L | Y | — | NQ | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 7.67 | — | — | 1 | µg/L | Y | — | NQ | 2013-1224 | CAMO-13-37048 | GELC |

**Table C-1 San Ildefonso Pueblo General Surveillance Monitoring Group Previously Unreported Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.24 | — | — | 1 | µg/L | Y | — | NQ | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 7.53 | — | — | 1 | µg/L | Y | — | NQ | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 7.28 | — | — | 1 | µg/L | Y | — | NQ | 2013-323 | CAMO-13-24281 | GELC |
| R-34 | 883.700 | 01/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | Y | 5.26 | — | — | 3.3 | µg/L | Y | J | J | 2014-2789 | CAMO-14-53219 | GELC |
| R-34 | 883.700 | 12/19/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | Y | 6.72 | — | — | 3.3 | µg/L | Y | J | J | 2014-2723 | CAMO-14-45694 | GELC |
| R-34 | 883.700 | 07/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | Y | 5.35 | — | — | 3.3 | µg/L | Y | J | J | 2013-1224 | CAMO-13-37048 | GELC |
| R-34 | 883.700 | 05/15/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | Y | 7.67 | — | — | 3.3 | µg/L | Y | J | J | 2013-855 | CAMO-13-30618 | GELC |
| R-34 | 883.700 | 02/13/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | Y | 7 | — | — | 3.3 | µg/L | Y | J | J | 2013-534 | CAMO-13-28424 | GELC |
| R-34 | 883.700 | 11/14/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | Y | 3.95 | — | — | 3.3 | µg/L | Y | J | J | 2013-323 | CAMO-13-24281 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.62 | — | — | 0.01 | SU | Y | H | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.7 | — | — | 0.01 | SU | Y | H | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.44 | — | — | 0.01 | SU | Y | H | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.58 | — | — | 0.01 | SU | Y | H | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.47 | — | — | 0.01 | SU | Y | H | J- | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 80.4 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 84.3 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 86.5 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 86.5 | — | — | 0.725 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 85.9 | — | — | 0.73 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 49.6 | — | — | 1 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 47.8 | — | — | 1 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 49.9 | — | — | 1 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 51.7 | — | — | 1 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 54.1 | — | — | 1 | µg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 27.4 | — | — | 15 | µg/L | Y | J | J | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 26.7 | — | — | 15 | µg/L | Y | J | J | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 37.9 | — | — | 15 | µg/L | Y | J | J | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 38.3 | — | — | 15 | µg/L | Y | J | J | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 52.6 | — | — | 15 | µg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.159 | — | — | 0.067 | mg/L | Y | J | J | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.142 | — | — | 0.067 | mg/L | Y | J | J | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.146 | — | — | 0.067 | mg/L | Y | J | J | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.19 | — | — | 0.067 | mg/L | Y | J | J | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.136 | — | — | 0.066 | mg/L | Y | J | J | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 27.9 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 27.9 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 30.4 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 28.4 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 29.2 | — | — | 0.05 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 17.5 | — | — | 0.335 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 16 | — | — | 0.335 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 18.9 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 18.5 | — | — | 0.067 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 19.1 | — | — | 0.13 | mg/L | Y | — | J+ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.486 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.485 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.467 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |

**Table C-1 San Ildefonso Pueblo General Surveillance Monitoring Group Previously Unreported Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.438 | — | — | 0.033 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.445 | — | — | 0.033 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 102 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 102 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 111 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 104 | — | — | 0.453 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 105 | — | — | 0.45 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.86 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.76 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 8.47 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.95 | — | — | 0.11 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.86 | — | — | 0.11 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.22 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.3 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.47 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.34 | — | — | 0.165 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.08 | — | — | 0.17 | µg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 0.804 | — | — | 0.5 | µg/L | Y | J | J | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.31 | — | — | 0.5 | µg/L | Y | J | J | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.64 | — | — | 0.5 | µg/L | Y | J | J | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.17 | — | — | 0.5 | µg/L | Y | J | J | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.51 | — | — | 0.5 | µg/L | Y | J | J | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.66 | — | — | 0.5 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.48 | — | — | 0.5 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.38 | — | — | 0.5 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.25 | — | — | 0.5 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 4.86 | — | — | 0.5 | µg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 5.27 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 4.66 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 5.23 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 5.43 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 5.76 | — | — | 0.05 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | Y | 1.97 | — | — | 1.5 | µg/L | Y | J | J | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | Y | 1.68 | — | — | 1.5 | µg/L | Y | J | J | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | Y | 1.72 | — | — | 1.5 | µg/L | Y | J | J | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | Y | 2 | — | — | 1.5 | µg/L | Y | J | J | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Selenium | Se | Y | 1.59 | — | — | 1.5 | µg/L | Y | J | J | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 45.3 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 42.4 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 46.9 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 46.3 | — | — | 0.053 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 46.1 | — | — | 0.053 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 18.1 | — | — | 0.1 | mg/L | Y | N | J+ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 16 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 18.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 18.1 | — | — | 0.1 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 20.7 | — | — | 0.1 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |

**Table C-1 San Ildefonso Pueblo General Surveillance Monitoring Group Previously Unreported Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 309 | — | — | 1 | µS/cm | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 309 | — | — | 1 | µS/cm | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 311 | — | — | 1 | µS/cm | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 303 | — | — | 1 | µS/cm | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 322 | — | — | 1 | µS/cm | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 139 | — | — | 1 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 135 | — | — | 1 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 147 | — | — | 1 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 144 | — | — | 1 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 146 | — | — | 1 | µg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.7 | — | — | 0.665 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.3 | — | — | 0.665 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.4 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.2 | — | — | 0.133 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.6 | — | — | 0.1 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 197 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 194 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 197 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 210 | — | — | 3.4 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 207 | — | — | 3.4 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.112 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46053 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | N | 0.1 | — | — | 0.033 | mg/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | N | 0.1 | — | — | 0.033 | mg/L | Y | U | U | 2013-409 | CALA-13-24549 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.0412 | — | — | 0.035 | mg/L | Y | J | J | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | N | 0.1 | — | — | 0.035 | mg/L | Y | U | UJ | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.31 | — | — | 0.33 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46053 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.959 | — | — | 0.33 | mg/L | Y | J | J | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.777 | — | — | 0.33 | mg/L | Y | J | J | 2013-409 | CALA-13-24549 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.19 | — | — | 0.33 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.3 | — | — | 0.33 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.58 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.06 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.16 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.74 | — | — | 0.067 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.39 | — | — | 0.067 | µg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.06 | — | — | 1 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 6.63 | — | — | 1 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.4 | — | — | 1 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 7.51 | — | — | 1 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 7.26 | — | — | 1 | µg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.02 | — | — | 0.01 | SU | Y | H | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.1 | — | — | 0.01 | SU | Y | H | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.1 | — | — | 0.01 | SU | Y | H | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.92 | — | — | 0.01 | SU | Y | H | J- | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.15 | — | — | 0.01 | SU | Y | H | J- | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 128 | — | — | 0.725 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 15.9 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 125 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 117 | — | — | 0.73 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 120 | — | — | 0.73 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00783 | 0.00691 | 0.0331 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0 | 0.00494 | 0.0397 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.00231 | 0.00516 | 0.0315 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00194 | 0.0034 | 0.032 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.0115 | 0.0047 | 0.036 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.148 | — | — | 0.017 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.05 | — | — | 0.017 | mg/L | Y | U | UJ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0259 | — | — | 0.017 | mg/L | Y | J | J | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0194 | — | — | 0.016 | mg/L | Y | J | J | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.05 | — | — | 0.016 | mg/L | Y | U | U | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Barium | Ba | Y | 115 | — | — | 1 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 115 | — | — | 1 | µg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 115 | — | — | 1 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 115 | — | — | 1 | µg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 111 | — | — | 1 | µg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Boron | B | Y | 52.1 | — | — | 15 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 52.7 | — | — | 15 | µg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 55.1 | — | — | 15 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 55.5 | — | — | 15 | µg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 53.4 | — | — | 15 | µg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.133 | — | — | 0.067 | mg/L | Y | J | J | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.136 | — | — | 0.067 | mg/L | Y | J | J | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.163 | — | — | 0.067 | mg/L | Y | J | J | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.111 | — | — | 0.066 | mg/L | Y | J | J | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.14 | — | — | 0.066 | mg/L | Y | J | J | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 36.3 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 37.3 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 35.8 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 34.6 | — | — | 0.05 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 34.4 | — | — | 0.05 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -1.32 | 1.66 | 5.72 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 1.3 | 1.75 | 6.59 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -1.43 | 1.28 | 4.44 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.509 | 1.7 | 5.8 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.943 | 1.6 | 4.8 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 7.29 | — | — | 0.067 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 7.62 | — | — | 0.067 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 7.1 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 6.91 | — | — | 0.066 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 6.96 | — | — | 0.066 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 2.21 | — | — | 2 | µg/L | Y | J | J | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 2.19 | — | — | 2 | µg/L | Y | J | J | 2014-2697 | CAWR-13-42159 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 2.01 | — | — | 2 | µg/L | Y | J | J | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | N | 10 | — | — | 2 | µg/L | Y | U | U | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | N | 10 | — | — | 2.5 | µg/L | Y | U | U | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -2.25 | 1.74 | 5.74 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.619 | 1.87 | 7.07 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -2.32 | 1.27 | 4.12 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.409 | 1.5 | 6 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 2.19 | 1.4 | 5.2 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.189 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.231 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | N | 0.241 | — | — | 0.033 | mg/L | Y | — | U | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.241 | — | — | 0.033 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.238 | — | — | 0.033 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 10.4 | 1.71 | 2.81 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 15.9 | 2.18 | 2.98 | — | pCi/L | Y | — | NQ | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 10.8 | 1.82 | 2.49 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 9.42 | 2 | 2.3 | — | pCi/L | Y | — | NQ | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 9.42 | 2 | 2.5 | — | pCi/L | Y | — | NQ | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 5.35 | 0.71 | 1.86 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.26 | 0.434 | 1.19 | — | pCi/L | Y | — | NQ | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.39 | 0.947 | 2.33 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 3.79 | 0.96 | 2.3 | — | pCi/L | Y | — | NQ | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 2.22 | 0.86 | 2.4 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 95 | — | — | 0.453 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 97.7 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 93.8 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 90.3 | — | — | 0.45 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 87.2 | — | — | 0.35 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 1.08 | — | — | 0.11 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.12 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.09 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 0.963 | — | — | 0.11 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.05 | — | — | 0.085 | mg/L | Y | — | J | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.27 | — | — | 0.165 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.21 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.14 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.08 | — | — | 0.17 | µg/L | Y | — | J | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.2 | — | — | 0.1 | µg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 1.82 | 3.28 | 11.8 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -0.808 | 3.14 | 11 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 0.856 | 2.47 | 8.93 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 1.22 | 2.7 | 9.7 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -1.77 | 2.6 | 8.3 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 2.33 | — | — | 0.085 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 2.67 | — | — | 0.085 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 2.32 | — | — | 0.085 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 2.18 | — | — | 0.05 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 1.6 | — | — | 0.1 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.972 | — | — | 0.05 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.888 | — | — | 0.05 | µg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.896 | — | — | 0.05 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.824 | — | — | 0.05 | µg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.874 | — | — | 0.05 | µg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00294 | 0.00657 | 0.0437 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.00807 | 0.0284 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.00441 | 0.0355 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.0017 | 0.032 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00416 | 0.0036 | 0.024 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00294 | 0.00657 | 0.0386 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0132 | 0.018 | 0.0682 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00624 | 0.00764 | 0.0422 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00928 | 0.005 | 0.031 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00623 | 0.0046 | 0.041 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.63 | — | — | 0.05 | mg/L | Y | E | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.85 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.84 | — | — | 0.05 | mg/L | Y | E | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.69 | — | — | 0.05 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.45 | — | — | 0.05 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 32.8 | 21.4 | 32.1 | — | pCi/L | Y | UI | R | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -6.92 | 20.9 | 83.3 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 27.5 | 16.5 | 55.5 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -6.74 | 18 | 71 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -23.6 | 16 | 52 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 29.1 | — | — | 0.053 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 30 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 29.8 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 28.7 | — | — | 0.053 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 29.7 | — | — | 0.053 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Sodium | Na | Y | 29.4 | — | — | 0.1 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 29.4 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 28 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 28 | — | — | 0.1 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 26.5 | — | — | 0.1 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.63 | 1.72 | 5.92 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 1.49 | 1.5 | 6.18 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.559 | 1.03 | 3.89 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.0124 | 1.4 | 5.5 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 0.537 | 1.3 | 4.5 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 300 | — | — | 3.63 | µS/cm | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 320 | — | — | 1 | µS/cm | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 319 | — | — | 1 | µS/cm | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 312 | — | — | 1 | µS/cm | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 313 | — | — | 1 | µS/cm | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 823 | — | — | 1 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 852 | — | — | 1 | µg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 831 | — | — | 1 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 796 | — | — | 1 | µg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 783 | — | — | 1 | µg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.205 | 0.129 | 0.487 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.0549 | 0.127 | 0.482 | — | pCi/L | Y | U | U | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0496 | 0.141 | 0.487 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.212 | 0.12 | 0.49 | — | pCi/L | Y | U | U | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.118 | 0.13 | 0.46 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 14.2 | — | — | 0.133 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 15 | — | — | 0.133 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 14.1 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 13.5 | — | — | 0.1 | mg/L | Y | — | J+ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 13.4 | — | — | 0.1 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 214 | — | — | 3.4 | mg/L | Y | — | J | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 187 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 177 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 191 | — | — | 3.4 | mg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 195 | — | — | 2.4 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.266 | — | — | 0.033 | mg/L | Y | — | J+ | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.0368 | — | — | 0.033 | mg/L | Y | J | J | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.114 | — | — | 0.035 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | N | 0.122 | — | — | 0.035 | mg/L | Y | — | U | 12-82 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.097 | — | — | 0.033 | mg/L | Y | J | J | 11-91 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.57 | — | — | 0.33 | mg/L | Y | J | J | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.727 | — | — | 0.33 | mg/L | Y | J | J | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.13 | — | — | 0.33 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 0.855 | — | — | 0.33 | mg/L | Y | J | U | 12-82 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.05 | — | — | 0.33 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | -1.27 | 0.684 | 2.32 | — | pCi/L | Y | U | U | 2015-49 | CAWR-14-86935 | ARSL |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.477 | 0.567 | 1.882 | — | pCi/L | Y | U | U | 2014-2713 | CAWR-13-42145 | ARSL |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | -0.388 | 0.669 | 2.294 | — | pCi/L | Y | U | U | 2013-25 | CAWR-12-23429 | ARSL |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.07 | 1.13 | 1.95 | — | pCi/L | Y | U | U | 12-97 | CAWR-11-27992 | ARSL |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | EPA:906.0 | Tritium | H-3 | N | -77.4176 | 62.8563 | 212.721 | — | pCi/L | Y | U | U | 11-115 | CAWR-10-25330 | ARSL |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 10.6 | — | — | 0.067 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 12.1 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 10.6 | — | — | 0.067 | µg/L | Y | E | NQ | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 11.4 | — | — | 0.067 | µg/L | Y | — | NQ | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 12.7 | — | — | 0.05 | µg/L | Y | E | NQ | 11-91 | CAWR-10-25329 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 6.84 | 0.131 | 0.0627 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 6.46 | 0.152 | 0.0441 | — | pCi/L | Y | — | NQ | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 5.72 | 0.12 | 0.0441 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 4.67 | 0.39 | 0.079 | — | pCi/L | Y | — | J+ | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 5.11 | 0.37 | 0.032 | — | pCi/L | Y | — | NQ | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.253 | 0.0282 | 0.0439 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.215 | 0.032 | 0.0397 | — | pCi/L | Y | — | NQ | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.164 | 0.0246 | 0.032 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.27 | 0.046 | 0.058 | — | pCi/L | Y | — | J+ | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.401 | 0.042 | 0.025 | — | pCi/L | Y | — | NQ | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 4.27 | 0.103 | 0.0334 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86935 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 4.19 | 0.123 | 0.0276 | — | pCi/L | Y | — | NQ | 2014-2697 | CAWR-13-42145 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 3.76 | 0.0975 | 0.03 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23429 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 3.13 | 0.27 | 0.093 | — | pCi/L | Y | — | J+ | 12-84 | CAWR-11-27992 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 3.2 | 0.24 | 0.02 | — | pCi/L | Y | — | NQ | 11-90 | CAWR-10-25330 | GELC |
| La Mesita Spring | — | 10/06/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Vanadium | V | Y | 3.33 | — | — | 1 | µg/L | Y | J | J | 2015-40 | CAWR-14-86962 | GELC |
| La Mesita Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 3.86 | — | — | 1 | µg/L | Y | J | J | 2014-2697 | CAWR-13-42159 | GELC |
| La Mesita Spring | — | 10/02/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 3.18 | — | — | 1 | µg/L | Y | J | J | 2013-23 | CAWR-12-23457 | GELC |
| La Mesita Spring | — | 10/12/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 3.16 | — | — | 1 | µg/L | Y | J | J | 12-83 | CAWR-11-27990 | GELC |
| La Mesita Spring | — | 10/07/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 2.65 | — | — | 1 | µg/L | Y | J | J | 11-91 | CAWR-10-25329 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.17 | — | — | 0.01 | SU | Y | H | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.17 | — | — | 0.01 | SU | Y | H | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.14 | — | — | 0.01 | SU | Y | H | NQ | 2014-2663 | CAWR-13-42160 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.37 | — | — | 0.01 | SU | Y | H | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.35 | — | — | 0.01 | SU | Y | H | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.39 | — | — | 0.01 | SU | Y | H | J- | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3 | ALK-CO3 | N | 1 | — | — | 0.725 | mg/L | Y | U | U | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3 | ALK-CO3 | Y | 2.01 | — | — | 0.725 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3 | ALK-CO3 | N | 1 | — | — | 0.725 | mg/L | Y | U | U | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3 | ALK-CO3 | Y | 4.13 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3 | ALK-CO3 | N | 1 | — | — | 0.725 | mg/L | Y | U | U | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3 | ALK-CO3 | Y | 2.08 | — | — | 0.73 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 107 | — | — | 0.725 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 107 | — | — | 0.725 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 111 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 110 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 136 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 110 | — | — | 0.73 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00497 | 0.00609 | 0.0315 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.00422 | 0.00517 | 0.0267 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.0227 | 0.0169 | 0.0608 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00245 | 0.00424 | 0.0334 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00249 | 0.00659 | 0.034 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.00974 | 0.0043 | 0.042 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.0102 | 0.0049 | 0.033 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0682 | — | — | 0.017 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0855 | — | — | 0.017 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.094 | — | — | 0.017 | mg/L | Y | — | U | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0474 | — | — | 0.017 | mg/L | Y | J | J | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0645 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.049 | — | — | 0.016 | mg/L | Y | J | U | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Barium | Ba | Y | 77.3 | — | — | 1 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Barium | Ba | Y | 78.1 | — | — | 1 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 60.5 | — | — | 1 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 70.6 | — | — | 1 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Barium | Ba | Y | 71 | — | — | 1 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 71.6 | — | — | 1 | µg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 59 | — | — | 1 | µg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Boron | B | Y | 32.8 | — | — | 15 | µg/L | Y | J | J | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Boron | B | Y | 32.3 | — | — | 15 | µg/L | Y | J | J | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 32.6 | — | — | 15 | µg/L | Y | J | J | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 34.7 | — | — | 15 | µg/L | Y | J | J | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Boron | B | Y | 35.2 | — | — | 15 | µg/L | Y | J | J | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 37.3 | — | — | 15 | µg/L | Y | J | J | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 24.8 | — | — | 15 | µg/L | Y | J | J | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 38.1 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 38.6 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 38.2 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 40.6 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 41.2 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 39.9 | — | — | 0.05 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 35.9 | — | — | 0.05 | mg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.465 | 1.98 | 6.9 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -1.11 | 1.45 | 5.11 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 1.39 | 1.41 | 4.89 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.348 | 1.12 | 4.4 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.948 | 1.54 | 5.97 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.222 | 1.2 | 4 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -1.05 | 1.3 | 4.2 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 4.77 | — | — | 0.067 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 4.78 | — | — | 0.067 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 7.09 | — | — | 0.067 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 4.48 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 4.53 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 4.91 | — | — | 0.066 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.0605 | 1.74 | 7 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 1.65 | 1.35 | 5.97 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -2 | 1.41 | 3.81 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.497 | 1.42 | 5.55 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.886 | 1.4 | 5.89 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 1.51 | 1.1 | 4.1 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.13 | 1.6 | 5.3 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.322 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.319 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.337 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.379 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.367 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.38 | — | — | 0.033 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 7.47 | 1.01 | 2.6 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | EPA:900 | Gross alpha | GROSSA | Y | 5.86 | 1.04 | 2.92 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 5.11 | 0.793 | 2.09 | — | pCi/L | Y | — | NQ | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 3.2 | 1.1 | 2.41 | — | pCi/L | Y | — | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | EPA:900 | Gross alpha | GROSSA | Y | 6.08 | 1.47 | 2.61 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 2.59 | 1 | 2.4 | — | pCi/L | Y | — | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 1.75 | 0.76 | 2 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 11.4 | 0.712 | 1.74 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | EPA:900 | Gross beta | GROSSB | Y | 10.1 | 0.764 | 2.02 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 5.63 | 0.936 | 2.62 | — | pCi/L | Y | — | NQ | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.35 | 0.922 | 2.25 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.96 | 0.972 | 2.24 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 1.91 | 0.91 | 2.8 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 2.21 | 0.96 | 3 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 123 | — | — | 0.453 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 124 | — | — | 0.453 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 124 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 133 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 135 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 126 | — | — | 0.35 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 115 | — | — | 0.35 | mg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 6.69 | — | — | 0.11 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 6.75 | — | — | 0.11 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.04 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.56 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.75 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.1 | — | — | 0.085 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 6.24 | — | — | 0.085 | mg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Manganese | Mn | Y | 7.14 | — | — | 2 | µg/L | Y | J | J | 2015-40 | CAWR-14-86966 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Manganese | Mn | Y | 6.16 | — | — | 2 | µg/L | Y | J | J | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 8.23 | — | — | 2 | µg/L | Y | J | J | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 7.66 | — | — | 2 | µg/L | Y | J | J | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 8.05 | — | — | 2 | µg/L | Y | J | J | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 5.31 | — | — | 2 | µg/L | Y | J | J | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 4.46 | — | — | 2 | µg/L | Y | J | J | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 5.73 | — | — | 0.165 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 5.64 | — | — | 0.165 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 5.53 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 6.69 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 6.43 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 7.17 | — | — | 0.1 | µg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 3.56 | — | — | 0.1 | µg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 3.31 | 2.79 | 10.9 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -3.84 | 3.02 | 9.96 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -3.44 | 2.23 | 7.58 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 2.7 | 2.53 | 9.56 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -1.65 | 2.98 | 10.4 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 0.473 | 2.6 | 8.7 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 9.46 | 3.3 | 10 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | HASL-300:Np-237 | Neptunium-237 | Np-237 | N | 0.0112 | 0.0059 | 0.013 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 0.647 | — | — | 0.5 | µg/L | Y | J | J | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 0.588 | — | — | 0.5 | µg/L | Y | J | J | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.15 | — | — | 0.5 | µg/L | Y | J | J | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.29 | — | — | 0.5 | µg/L | Y | J | J | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 0.999 | — | — | 0.5 | µg/L | Y | J | J | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.22 | — | — | 0.5 | µg/L | Y | J | J | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.52 | — | — | 0.5 | µg/L | Y | J | J | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.0723 | — | — | 0.017 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.0763 | — | — | 0.017 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.222 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.25 | — | — | 0.05 | mg/L | Y | U | U | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.0585 | — | — | 0.05 | µg/L | Y | J | J | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.0611 | — | — | 0.05 | µg/L | Y | J | J | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.0717 | — | — | 0.05 | µg/L | Y | J | J | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.0724 | — | — | 0.05 | µg/L | Y | J | J | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.074 | — | — | 0.05 | µg/L | Y | J | J | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.0711 | — | — | 0.05 | µg/L | Y | J | J | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.0108 | 0.04 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00588 | 0.00831 | 0.0437 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00806 | 0.00988 | 0.0347 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00297 | 0.00664 | 0.0338 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00277 | 0.00479 | 0.0315 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00437 | 0.0031 | 0.025 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00511 | 0.0036 | 0.034 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.0215 | 0.017 | 0.0353 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00882 | 0.00882 | 0.0386 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0121 | 0.0145 | 0.0834 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00297 | 0.00786 | 0.0401 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0083 | 0.00618 | 0.0374 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0 | 0.0022 | 0.043 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00767 | 0.0057 | 0.035 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.64 | — | — | 0.05 | mg/L | Y | E | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.66 | — | — | 0.05 | mg/L | Y | E | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.79 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.66 | — | — | 0.05 | mg/L | Y | E | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.69 | — | — | 0.05 | mg/L | Y | E | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.55 | — | — | 0.05 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.02 | — | — | 0.05 | mg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -32.2 | 21.3 | 74.2 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 48 | 16.4 | 77.3 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 17.8 | 21.3 | 40.6 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -19.5 | 15.8 | 57.8 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -12.2 | 17 | 62.3 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -6.95 | 16 | 52 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 22.6 | 19 | 74 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 20.5 | — | — | 0.053 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 20.6 | — | — | 0.053 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 22.8 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 19.5 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 19.7 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 19.2 | — | — | 0.053 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Sodium | Na | Y | 18.7 | — | — | 0.1 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Sodium | Na | Y | 19.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 19.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 18.1 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Sodium | Na | Y | 18.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 17.1 | — | — | 0.1 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 13.6 | — | — | 0.1 | mg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.67 | 1.82 | 6.59 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.704 | 1.58 | 5.88 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.76 | 1.28 | 4.33 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -2.79 | 1.36 | 3.95 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 0.358 | 1.38 | 5.43 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.156 | 1.3 | 4.2 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -2.4 | 1.6 | 4.4 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 305 | — | — | 3.63 | µS/cm | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 305 | — | — | 3.63 | µS/cm | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 333 | — | — | 1 | µS/cm | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 1.25 | — | — | 1 | µS/cm | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 337 | — | — | 1 | µS/cm | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 333 | — | — | 1 | µS/cm | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 306 | — | — | 1 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 312 | — | — | 1 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 302 | — | — | 1 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 319 | — | — | 1 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 322 | — | — | 1 | µg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 306 | — | — | 1 | µg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 263 | — | — | 1 | µg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.289 | 0.126 | 0.486 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0751 | 0.138 | 0.479 | — | pCi/L | Y | U | U | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.0615 | 0.079 | 0.274 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42146 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0644 | 0.141 | 0.489 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0373 | 0.133 | 0.475 | — | pCi/L | Y | U | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.345 | 0.16 | 0.5 | — | pCi/L | Y | U | U | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.33 | 0.16 | 0.5 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 46 | — | — | 0.665 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 46 | — | — | 0.665 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 45.2 | — | — | 0.665 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 47.4 | — | — | 0.665 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 47.9 | — | — | 0.665 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 41.1 | — | — | 0.5 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 189 | — | — | 3.4 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 173 | — | — | 3.4 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 189 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 183 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 186 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 208 | — | — | 2.4 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.56 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.646 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.436 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.115 | — | — | 0.035 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.114 | — | — | 0.035 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.311 | — | — | 0.033 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | N | 0.1 | — | — | 0.033 | mg/L | Y | U | U | 10-3671 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 2.69 | — | — | 0.33 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 2.72 | — | — | 0.33 | mg/L | Y | — | NQ | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 2.42 | — | — | 0.33 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 3.51 | — | — | 0.33 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 3.5 | — | — | 0.33 | mg/L | Y | — | NQ | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 3.23 | — | — | 0.33 | mg/L | Y | — | NQ | 11-91 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 3.88 | — | — | 0.33 | mg/L | Y | — | NQ | 10-3671 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.84 | — | — | 0.067 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.82 | — | — | 0.067 | µg/L | Y | — | NQ | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.97 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.88 | — | — | 0.067 | µg/L | Y | E | NQ | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.75 | — | — | 0.067 | µg/L | Y | E | NQ | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 3.13 | — | — | 0.05 | µg/L | Y | E | NQ | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.4 | — | — | 0.05 | µg/L | Y | — | NQ | 10-3672 | CAWR-10-24227 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.24 | 0.0754 | 0.113 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.27 | 0.0567 | 0.0623 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.64 | 0.0739 | 0.0408 | — | pCi/L | Y | — | J | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.938 | 0.0435 | 0.0333 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.96 | 0.0435 | 0.0327 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.24 | 0.099 | 0.032 | — | pCi/L | Y | — | NQ | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.688 | 0.065 | 0.066 | — | pCi/L | Y | — | NQ | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0945 | 0.0255 | 0.0792 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86939 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.055 | 0.0137 | 0.0436 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0732 | 0.0199 | 0.0368 | — | pCi/L | Y | — | J | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0515 | 0.0124 | 0.0242 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0299 | 0.01 | 0.0238 | — | pCi/L | Y | — | U | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0985 | 0.017 | 0.025 | — | pCi/L | Y | — | NQ | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0319 | 0.011 | 0.04 | — | pCi/L | Y | U | U | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.809 | 0.0607 | 0.0603 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86939 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.732 | 0.0429 | 0.0332 | — | pCi/L | Y | — | NQ | 2015-40 | CAWR-14-86880 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 1.01 | 0.0581 | 0.0256 | — | pCi/L | Y | — | J | 2014-2663 | CAWR-13-42146 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.587 | 0.0334 | 0.0226 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23433 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.657 | 0.0352 | 0.0223 | — | pCi/L | Y | — | NQ | 2013-23 | CAWR-12-23402 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.814 | 0.069 | 0.019 | — | pCi/L | Y | — | NQ | 11-90 | CAWR-10-25403 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.441 | 0.046 | 0.046 | — | pCi/L | Y | — | NQ | 10-3673 | CAWR-10-24226 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | REG | INORGANIC | SW-846:6010C | Vanadium | V | Y | 4.53 | — | — | 1 | µg/L | Y | J | J | 2015-40 | CAWR-14-86966 | GELC |
| Rio Grande at Otowi Bridge | — | 10/06/14 | WS | F | INIT | FD | INORGANIC | SW-846:6010C | Vanadium | V | Y | 4.38 | — | — | 1 | µg/L | Y | J | J | 2015-40 | CAWR-14-86884 | GELC |
| Rio Grande at Otowi Bridge | — | 12/11/13 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 3.06 | — | — | 1 | µg/L | Y | J | J | 2014-2663 | CAWR-13-42160 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 3.97 | — | — | 1 | µg/L | Y | J | J | 2013-23 | CAWR-12-23461 | GELC |
| Rio Grande at Otowi Bridge | — | 10/02/12 | WS | F | INIT | FD | INORGANIC | SW-846:6010B | Vanadium | V | Y | 4.09 | — | — | 1 | µg/L | Y | J | J | 2013-23 | CAWR-12-23405 | GELC |
| Rio Grande at Otowi Bridge | — | 10/07/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 3.99 | — | — | 1 | µg/L | Y | J | J | 11-91 | CAWR-10-25402 | GELC |
| Rio Grande at Otowi Bridge | — | 07/13/10 | WS | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 2.65 | — | — | 1 | µg/L | Y | J | J | 10-3672 | CAWR-10-24227 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.64 | — | — | 0.01 | SU | Y | H | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.82 | — | — | 0.01 | SU | Y | H | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.42 | — | — | 0.01 | SU | Y | H | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.38 | — | — | 0.01 | SU | Y | H | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.57 | — | — | 0.01 | SU | Y | H | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.54 | — | — | 0.01 | SU | Y | H | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.63 | — | — | 0.01 | SU | Y | H | J- | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.78 | — | — | 0.01 | SU | Y | H | J- | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.6 | — | — | 0.01 | SU | Y | H | J- | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 182 | — | — | 0.725 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 184 | — | — | 0.725 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 238 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 237 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 124 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 127 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 142 | — | — | 0.73 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 136 | — | — | 0.73 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 133 | — | — | 0.73 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.0385 | 0.0545 | 0.402 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.136 | 0.101 | 0.474 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00461 | 0.00461 | 0.0371 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.00463 | 0.00567 | 0.0372 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.0128 | 0.00676 | 0.0349 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.00253 | 0.00438 | 0.0345 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0 | 0.0066 | 0.077 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00109 | 0.0046 | 0.043 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00255 | 0.0035 | 0.029 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.162 | — | — | 0.017 | mg/L | Y | — | J | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.106 | — | — | 0.017 | mg/L | Y | — | J | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.144 | — | — | 0.017 | mg/L | Y | — | U | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.589 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.13 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0591 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0328 | — | — | 0.016 | mg/L | Y | J | J+ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.038 | — | — | 0.016 | mg/L | Y | J | U | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.096 | — | — | 0.016 | mg/L | Y | — | U | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 4.85 | — | — | 1.7 | µg/L | Y | J | J | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Arsenic | As | Y | 4.73 | — | — | 1.7 | µg/L | Y | J | J | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 3.29 | — | — | 1.7 | µg/L | Y | J | J | 2014-2681 | CAWR-13-42161 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Arsenic | As | Y | 4.06 | — | — | 1.7 | µg/L | Y | J | J | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 2.88 | — | — | 1.7 | µg/L | Y | J | J | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Arsenic | As | Y | 2.89 | — | — | 1.7 | µg/L | Y | J | J | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 1.85 | — | — | 1.7 | µg/L | Y | J | J | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 3.35 | — | — | 1.5 | µg/L | Y | J | J | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Arsenic | As | Y | 2.48 | — | — | 1.5 | µg/L | Y | J | J | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Barium | Ba | Y | 115 | — | — | 1 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Barium | Ba | Y | 118 | — | — | 1 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 239 | — | — | 1 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Barium | Ba | Y | 236 | — | — | 1 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 81.2 | — | — | 1 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Barium | Ba | Y | 83.1 | — | — | 1 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 92.7 | — | — | 1 | µg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 92 | — | — | 1 | µg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Barium | Ba | Y | 91.9 | — | — | 1 | µg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Boron | B | Y | 30.1 | — | — | 15 | µg/L | Y | J | J | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Boron | B | Y | 30.3 | — | — | 15 | µg/L | Y | J | J | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 29.9 | — | — | 15 | µg/L | Y | J | J | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Boron | B | Y | 27.8 | — | — | 15 | µg/L | Y | J | J | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 36.3 | — | — | 15 | µg/L | Y | J | J | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Boron | B | Y | 35.8 | — | — | 15 | µg/L | Y | J | J | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 32.2 | — | — | 15 | µg/L | Y | J | J | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 31.2 | — | — | 15 | µg/L | Y | J | J | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Boron | B | Y | 30.3 | — | — | 15 | µg/L | Y | J | J | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.0768 | — | — | 0.067 | mg/L | Y | J | J | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.0752 | — | — | 0.067 | mg/L | Y | J | J | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.121 | — | — | 0.067 | mg/L | Y | J | J | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.13 | — | — | 0.067 | mg/L | Y | J | J | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | N | 0.2 | — | — | 0.067 | mg/L | Y | U | U | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | N | 0.2 | — | — | 0.067 | mg/L | Y | U | U | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | N | 0.2 | — | — | 0.066 | mg/L | Y | U | U | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | N | 0.2 | — | — | 0.066 | mg/L | Y | U | U | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | N | 0.2 | — | — | 0.066 | mg/L | Y | U | U | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 45 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 46.5 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 68.8 | — | — | 0.05 | mg/L | Y | — | J- | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 67.7 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 34 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 34.6 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 38.4 | — | — | 0.05 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 38.7 | — | — | 0.05 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 38 | — | — | 0.05 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.179 | 1.13 | 4.24 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 2.17 | 1.52 | 5.72 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 1.82 | 1.17 | 4.36 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.99 | 1.26 | 4.26 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.127 | 1.41 | 5.26 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -3.2 | 1.64 | 5.25 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -2.24 | 1.2 | 3.5 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.871 | 1.6 | 5 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -2.27 | 1.9 | 6.5 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 3.97 | — | — | 0.067 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 4.02 | — | — | 0.067 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 10.6 | — | — | 0.134 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 10.9 | — | — | 0.134 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 3.13 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 3.12 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.99 | — | — | 0.066 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.94 | — | — | 0.066 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.94 | — | — | 0.066 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -0.977 | 1.2 | 4.31 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -2.76 | 1.65 | 5.26 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -0.504 | 1.22 | 4.45 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -1.84 | 1.41 | 4.79 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -0.906 | 1.32 | 4.85 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.89 | 1.52 | 6.06 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 1.41 | 1.3 | 5.4 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 1.07 | 1.5 | 5.4 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.92 | 1.5 | 5.1 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.611 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.643 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.621 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.633 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.453 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.451 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.496 | — | — | 0.033 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.495 | — | — | 0.033 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.519 | — | — | 0.033 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.713 | 0.474 | 1.58 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.388 | 0.412 | 1.41 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 6.98 | 1.43 | 2.94 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | EPA:900 | Gross alpha | GROSSA | Y | 6.61 | 1.39 | 2.99 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.42 | 0.657 | 2.68 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | EPA:900 | Gross alpha | GROSSA | N | 1.18 | 0.781 | 2.57 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 2.36 | 1.1 | 2.8 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 1.2 | 0.78 | 2.4 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | EPA:900 | Gross alpha | GROSSA | N | 1.21 | 0.8 | 2.5 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 1.37 | 0.456 | 1.47 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | EPA:900 | Gross beta | GROSSB | Y | 2.14 | 0.542 | 1.72 | — | pCi/L | Y | — | NQ | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.43 | 0.453 | 1.27 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.21 | 0.399 | 1.05 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 1.67 | 0.675 | 2.09 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | EPA:900 | Gross beta | GROSSB | N | 0.593 | 0.663 | 2.33 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 2.08 | 0.82 | 2.4 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 1.39 | 0.81 | 2.6 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | EPA:900 | Gross beta | GROSSB | N | 2.44 | 0.85 | 2.4 | — | pCi/L | Y | — | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 123 | — | — | 0.453 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 126 | — | — | 0.453 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 191 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 189 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 92.4 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 94.1 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 102 | — | — | 0.45 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 102 | — | — | 0.35 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 101 | — | — | 0.35 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Iron | Fe | Y | 429 | — | — | 30 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Iron | Fe | Y | 445 | — | — | 30 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Iron | Fe | Y | 158 | — | — | 30 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Iron | Fe | Y | 155 | — | — | 30 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Iron | Fe | Y | 45.9 | — | — | 30 | µg/L | Y | J | J | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Iron | Fe | Y | 38.8 | — | — | 30 | µg/L | Y | J | J | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Iron | Fe | Y | 46.2 | — | — | 30 | µg/L | Y | J | J | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Iron | Fe | Y | 118 | — | — | 30 | µg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Iron | Fe | Y | 126 | — | — | 30 | µg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 2.46 | — | — | 0.11 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 2.52 | — | — | 0.11 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 4.78 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 4.79 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.82 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.85 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.53 | — | — | 0.11 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.4 | — | — | 0.085 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.4 | — | — | 0.085 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Manganese | Mn | Y | 679 | — | — | 2 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Manganese | Mn | Y | 706 | — | — | 2 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 994 | — | — | 2 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 992 | — | — | 2 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 35.1 | — | — | 2 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 35 | — | — | 2 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 152 | — | — | 2 | µg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 424 | — | — | 2 | µg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 402 | — | — | 2 | µg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 0.802 | — | — | 0.165 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 0.894 | — | — | 0.165 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.28 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.19 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.47 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.34 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.51 | — | — | 0.17 | µg/L | Y | — | J | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.47 | — | — | 0.1 | µg/L | Y | — | J | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.5 | — | — | 0.1 | µg/L | Y | — | J | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 0.886 | 2.48 | 8.89 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 2.51 | 2.63 | 9.5 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 2.22 | 2.27 | 8.43 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 1.63 | 2.69 | 8.33 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 5.91 | 2.49 | 10 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -5.71 | 2.61 | 8.39 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 0.52 | 2.4 | 8.8 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -5.8 | 3 | 9 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -0.997 | 2.1 | 6.8 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.0643 | 0.0454 | 0.215 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 5.74E-09 | 0.0422 | 0.231 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.00565 | 0.0199 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00241 | 0.00933 | 0.0207 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.00347 | 0.028 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00263 | 0.00456 | 0.0299 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.0413 | 0.021 | 0.09 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00383 | 0.0027 | 0.022 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.002 | 0.023 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.0803 | 0.0579 | 0.318 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.0172 | 0.0455 | 0.34 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00461 | 0.00652 | 0.0478 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00481 | 0.00963 | 0.0498 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00491 | 0.00602 | 0.0332 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00263 | 0.00696 | 0.0356 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0381 | 0.014 | 0.087 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00382 | 0.0033 | 0.037 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00199 | 0.002 | 0.039 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.45 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.46 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 3.17 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Potassium | K | Y | 3.17 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.58 | — | — | 0.05 | mg/L | Y | E | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.66 | — | — | 0.05 | mg/L | Y | E | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.25 | — | — | 0.05 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.8 | — | — | 0.05 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.78 | — | — | 0.05 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -3.62 | 15.6 | 57.6 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -12.8 | 19 | 70.1 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -15.8 | 14.2 | 49.6 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 0.0775 | 17 | 62.5 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -32.3 | 18.9 | 63.7 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -7.56 | 16.7 | 65.6 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -34.2 | 17 | 61 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 31.4 | 18 | 70 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 24.6 | 18 | 66 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 53.5 | — | — | 0.053 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 55 | — | — | 0.053 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 54 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 53.5 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 45.3 | — | — | 0.265 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 47 | — | — | 0.265 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 46.2 | — | — | 0.053 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 47.7 | — | — | 0.053 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 46.2 | — | — | 0.053 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Sodium | Na | Y | 24.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Sodium | Na | Y | 24.6 | — | — | 0.1 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 40.7 | — | — | 0.1 | mg/L | Y | — | J- | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Sodium | Na | Y | 40.3 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 20.8 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Sodium | Na | Y | 21.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 22.4 | — | — | 0.1 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 22.2 | — | — | 0.1 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Sodium | Na | Y | 21.8 | — | — | 0.1 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 0.19 | 1.18 | 4.6 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 0.629 | 1.43 | 4.9 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.467 | 1.46 | 4.55 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -2.85 | 1.38 | 4.43 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.43 | 1.06 | 3.63 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.611 | 1.46 | 5.42 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 0.648 | 1.3 | 5.2 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 1.07 | 1.6 | 5.6 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.319 | 1.3 | 4.2 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 330 | — | — | 3.63 | µS/cm | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 330 | — | — | 3.63 | µS/cm | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 529 | — | — | 1 | µS/cm | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 531 | — | — | 1 | µS/cm | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 280 | — | — | 1 | µS/cm | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 321 | — | — | 1 | µS/cm | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 292 | — | — | 1 | µS/cm | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 292 | — | — | 1 | µS/cm | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 300 | — | — | 1 | µS/cm | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 514 | — | — | 1 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 531 | — | — | 1 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 665 | — | — | 1 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 653 | — | — | 1 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 403 | — | — | 1 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 410 | — | — | 1 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 455 | — | — | 1 | µg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 474 | — | — | 1 | µg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 463 | — | — | 1 | µg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.464 | 0.16 | 0.48 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0938 | 0.141 | 0.486 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.187 | 0.104 | 0.343 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.473 | 0.162 | 0.495 | — | pCi/L | Y | U | U | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.207 | 0.124 | 0.476 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0223 | 0.137 | 0.493 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.251 | 0.12 | 0.49 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.189 | 0.13 | 0.45 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.0162 | 0.13 | 0.48 | — | pCi/L | Y | U | U | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 3.76 | — | — | 0.133 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 3.59 | — | — | 0.133 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 27.7 | — | — | 0.266 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 29.4 | — | — | 0.266 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 8.03 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 8.08 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 5.52 | — | — | 0.1 | mg/L | Y | — | J+ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 4.05 | — | — | 0.1 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 4.01 | — | — | 0.1 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 260 | — | — | 3.4 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 247 | — | — | 3.4 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 326 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 327 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 161 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 181 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 189 | — | — | 3.4 | mg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 200 | — | — | 2.4 | mg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 205 | — | — | 2.4 | mg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.172 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.192 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-207 | CAWR-14-89222 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.203 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.248 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.126 | — | — | 0.035 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | N | 0.1 | — | — | 0.035 | mg/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.0941 | — | — | 0.035 | mg/L | Y | J | J- | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | N | 0.1 | — | — | 0.033 | mg/L | Y | U | U | 11-63 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.085 | — | — | 0.033 | mg/L | Y | J | J | 11-63 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 2.91 | — | — | 0.33 | mg/L | Y | — | J- | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 2.85 | — | — | 0.33 | mg/L | Y | — | J- | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 4.37 | — | — | 0.33 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 4.02 | — | — | 0.33 | mg/L | Y | — | NQ | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 2.35 | — | — | 0.33 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 2.42 | — | — | 0.33 | mg/L | Y | — | NQ | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 1.21 | — | — | 0.33 | mg/L | Y | — | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 1.43 | — | — | 0.33 | mg/L | Y | — | U | 11-63 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 1.45 | — | — | 0.33 | mg/L | Y | — | U | 11-63 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.506 | 0.736 | 2.458 | — | pCi/L | Y | U | U | 2015-230 | CAWR-14-89229 | ARSL |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.433 | 0.778 | 2.609 | — | pCi/L | Y | U | U | 2015-230 | CAWR-14-89222 | ARSL |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 2.432 | 0.733 | 1.99 | — | pCi/L | Y | — | J- | 2014-2713 | CAWR-13-42147 | ARSL |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 1.554 | 0.64 | 1.918 | — | pCi/L | Y | U | U | 2014-2713 | CAWR-13-42126 | ARSL |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.654 | 0.589 | 1.932 | — | pCi/L | Y | U | U | 2013-29 | CAWR-12-23434 | ARSL |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.316 | 0.643 | 2.16 | — | pCi/L | Y | U | U | 2013-29 | CAWR-12-23403 | ARSL |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.42 | 1.21 | 2.06 | — | pCi/L | Y | U | U | 12-97 | CAWR-11-27994 | ARSL |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | EPA:906.0 | Tritium | H-3 | N | -24.3512 | 63.7201 | 214.113 | — | pCi/L | Y | U | U | 11-115 | CAWR-10-25332 | ARSL |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 21.5418 | 3.3488 | 2.1896 | — | pCi/L | Y | — | NQ | 11-115 | CAWR-10-26567 | ARSL |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.25 | — | — | 0.067 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Uranium | U | Y | 0.263 | — | — | 0.067 | µg/L | Y | — | NQ | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 5.45 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Uranium | U | Y | 5.55 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.12 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.14 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.38 | — | — | 0.067 | µg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 4.27 | — | — | 0.05 | µg/L | Y | — | NQ | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.14 | — | — | 0.05 | µg/L | Y | — | NQ | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | N | 0.204 | 0.0223 | 0.039 | — | pCi/L | Y | — | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.238 | 0.0227 | 0.0383 | — | pCi/L | Y | — | J | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 3.52 | 0.0972 | 0.0332 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 3.4 | 0.0966 | 0.0338 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.689 | 0.0417 | 0.0401 | — | pCi/L | Y | — | J | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.644 | 0.0422 | 0.0437 | — | pCi/L | Y | — | NQ | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.949 | 0.088 | 0.061 | — | pCi/L | Y | — | NQ | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.726 | 0.063 | 0.032 | — | pCi/L | Y | — | NQ | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.772 | 0.067 | 0.034 | — | pCi/L | Y | — | NQ | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0118 | 0.00781 | 0.034 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0116 | 0.00694 | 0.0334 | — | pCi/L | Y | U | U | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0793 | 0.0181 | 0.0299 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0841 | 0.0187 | 0.0304 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.00846 | 0.00846 | 0.0291 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0153 | 0.0102 | 0.0317 | — | pCi/L | Y | U | U | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0362 | 0.015 | 0.045 | — | pCi/L | Y | U | U | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0734 | 0.014 | 0.025 | — | pCi/L | Y | — | NQ | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0856 | 0.016 | 0.027 | — | pCi/L | Y | — | NQ | 11-65 | CAWR-10-26567 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.168 | 0.0185 | 0.0374 | — | pCi/L | Y | — | NQ | 2015-207 | CAWR-14-89229 | GELC |
| Sacred Spring | — | 10/30/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.154 | 0.0178 | 0.0367 | — | pCi/L | Y | — | NQ | 2015-207 | CAWR-14-89222 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 1.67 | 0.067 | 0.0208 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42147 | GELC |
| Sacred Spring | — | 12/12/13 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 1.87 | 0.0716 | 0.0212 | — | pCi/L | Y | — | NQ | 2014-2681 | CAWR-13-42126 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.356 | 0.0287 | 0.0273 | — | pCi/L | Y | — | J | 2013-36 | CAWR-12-23434 | GELC |
| Sacred Spring | — | 10/03/12 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.414 | 0.0324 | 0.0297 | — | pCi/L | Y | — | NQ | 2013-36 | CAWR-12-23403 | GELC |
| Sacred Spring | — | 10/14/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.41 | 0.048 | 0.072 | — | pCi/L | Y | — | NQ | 12-107 | CAWR-11-27994 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.387 | 0.038 | 0.02 | — | pCi/L | Y | — | NQ | 11-65 | CAWR-10-25332 | GELC |
| Sacred Spring | — | 10/06/10 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.352 | 0.037 | 0.021 | — | pCi/L | Y | — | NQ | 11-65 | CAWR-10-26567 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Vanadium | V | Y | 1.43 | — | — | 1 | µg/L | Y | J | J | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Vanadium | V | Y | 1.48 | — | — | 1 | µg/L | Y | J | J | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 2.29 | — | — | 1 | µg/L | Y | J | J | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Vanadium | V | Y | 3.44 | — | — | 1 | µg/L | Y | J | J | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.77 | — | — | 1 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Vanadium | V | Y | 9.33 | — | — | 1 | µg/L | Y | — | NQ | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 6.96 | — | — | 1 | µg/L | Y | — | NQ | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 4.1 | — | — | 1 | µg/L | Y | J | J | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Vanadium | V | Y | 3.94 | — | — | 1 | µg/L | Y | J | J | 11-64 | CAWR-10-26566 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 2015-207 | CAWR-14-89236 | GELC |
| Sacred Spring | — | 10/30/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Zinc | Zn | Y | 3.97 | — | — | 3.3 | µg/L | Y | J | J | 2015-207 | CAWR-14-89223 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | Y | 4.21 | — | — | 3.3 | µg/L | Y | J | J | 2014-2681 | CAWR-13-42161 | GELC |
| Sacred Spring | — | 12/12/13 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Zinc | Zn | Y | 4.95 | — | — | 3.3 | µg/L | Y | J | J | 2014-2681 | CAWR-13-42128 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 2013-36 | CAWR-12-23462 | GELC |
| Sacred Spring | — | 10/03/12 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 2013-36 | CAWR-12-23406 | GELC |
| Sacred Spring | — | 10/14/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 12-107 | CAWR-11-27993 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 11-64 | CAWR-10-25334 | GELC |
| Sacred Spring | — | 10/06/10 | WG | F | INIT | FD | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 11-64 | CAWR-10-26566 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.59 | — | — | 0.01 | SU | Y | H | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.94 | — | — | 0.01 | SU | Y | H | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.92 | — | — | 0.01 | SU | Y | H | J- | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.06 | — | — | 0.01 | SU | Y | H | J- | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.06 | — | — | 0.01 | SU | Y | H | J- | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 96.9 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 93.9 | — | — | 0.725 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 90.1 | — | — | 0.73 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 92.2 | — | — | 0.73 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 95 | — | — | 0.73 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0 | 0.00666 | 0.0527 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.0124 | 0.00656 | 0.0398 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00261 | 0.00585 | 0.0357 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00907 | 0.0046 | 0.037 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00447 | 0.0026 | 0.03 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 5.51 | — | — | 1.7 | µg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 1.78 | — | — | 1.7 | µg/L | Y | J | J | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 4.42 | — | — | 1.7 | µg/L | Y | J | J | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 2.97 | — | — | 1.7 | µg/L | Y | J | J | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 2.25 | — | — | 1.5 | µg/L | Y | J | J | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Barium | Ba | Y | 21.9 | — | — | 1 | µg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 22.2 | — | — | 1 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 22 | — | — | 1 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 21.9 | — | — | 1 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 24.7 | — | — | 1 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Boron | B | Y | 38.5 | — | — | 15 | µg/L | Y | J | J | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 36.9 | — | — | 15 | µg/L | Y | J | J | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 39.7 | — | — | 15 | µg/L | Y | J | J | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 37.9 | — | — | 15 | µg/L | Y | J | J | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 39.3 | — | — | 15 | µg/L | Y | J | J | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 15.4 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 15.5 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 15.1 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 15.8 | — | — | 0.05 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 15.3 | — | — | 0.05 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.765 | 1.38 | 4.78 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.336 | 1.62 | 5.75 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -1.4 | 1.65 | 5.82 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 1.53 | 1.8 | 6.6 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.538 | 1.5 | 5.1 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.99 | — | — | 0.067 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.89 | — | — | 0.067 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.79 | — | — | 0.066 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.95 | — | — | 0.066 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.9 | — | — | 0.066 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 5.38 | — | — | 2 | µg/L | Y | J | J | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 4.57 | — | — | 2 | µg/L | Y | J | J | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 5.37 | — | — | 2 | µg/L | Y | J | J | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 4.96 | — | — | 2 | µg/L | Y | J | J | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 6.34 | — | — | 2.5 | µg/L | Y | J | J | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 5.67 | 1.51 | 6.8 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.334 | 1.55 | 6.03 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -0.175 | 1.26 | 4.86 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -0.202 | 1.5 | 5.8 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -1.12 | 1.4 | 4.5 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.532 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.43 | — | — | 0.033 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.489 | — | — | 0.033 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.474 | — | — | 0.033 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.615 | — | — | 0.033 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 2.52 | 0.939 | 2.87 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 3.22 | 0.488 | 1.25 | — | pCi/L | Y | — | NQ | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 3.89 | 1.18 | 2.58 | — | pCi/L | Y | — | NQ | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 3.28 | 0.98 | 1.9 | — | pCi/L | Y | — | NQ | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 5.34 | 1.4 | 2.2 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 1.24 | 0.878 | 2.88 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 3.4 | 0.834 | 2.53 | — | pCi/L | Y | — | NQ | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.59 | 0.736 | 2.13 | — | pCi/L | Y | — | NQ | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 3.13 | 1 | 2.9 | — | pCi/L | Y | — | NQ | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 11.3 | 1.7 | 2.8 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 42.7 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 42.7 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 41.3 | — | — | 0.453 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 43.5 | — | — | 0.45 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 42.4 | — | — | 0.35 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 0.993 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 0.967 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 0.886 | — | — | 0.11 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 0.986 | — | — | 0.11 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 0.992 | — | — | 0.085 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.61 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.58 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.68 | — | — | 0.165 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.55 | — | — | 0.17 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.29 | — | — | 0.1 | µg/L | Y | — | J | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -1.26 | 2.36 | 8.03 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -0.426 | 2.59 | 8.86 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -4.68 | 2.77 | 9.16 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 2.74 | 2.6 | 9.6 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -2.62 | 2.9 | 9.1 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.38 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.38 | — | — | 0.017 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.369 | — | — | 0.05 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.381 | — | — | 0.05 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.413 | — | — | 0.05 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.323 | — | — | 0.05 | µg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.282 | — | — | 0.05 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.338 | — | — | 0.05 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.314 | — | — | 0.05 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.324 | — | — | 0.05 | µg/L | Y | — | NQ | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.00395 | 0.0415 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.00454 | 0.0276 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00976 | 0.00728 | 0.037 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.0035 | 0.043 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00169 | 0.0017 | 0.019 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00279 | 0.0128 | 0.0366 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00963 | 0.00718 | 0.0665 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00325 | 0.00861 | 0.044 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00246 | 0.0035 | 0.042 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00844 | 0.0041 | 0.033 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.08 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.16 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.09 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.1 | — | — | 0.05 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.11 | — | — | 0.05 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 7.32 | 22.2 | 38.6 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -18.6 | 18.1 | 63.5 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -21.2 | 15.2 | 54.9 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 10.1 | 20 | 81 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -17 | 17 | 62 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 32.9 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 34.6 | — | — | 0.053 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 32.3 | — | — | 0.053 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 32.5 | — | — | 0.053 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 32.5 | — | — | 0.053 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Sodium | Na | Y | 31.8 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 30 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 29.8 | — | — | 0.1 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 29.3 | — | — | 0.1 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 29.7 | — | — | 0.1 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.4 | 1.34 | 4.51 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -4.35 | 1.61 | 4.41 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.698 | 1.2 | 4.48 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 1.27 | 1.3 | 5.6 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.398 | 1.6 | 5.2 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 203 | — | — | 3.63 | µS/cm | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 213 | — | — | 1 | µS/cm | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 206 | — | — | 1 | µS/cm | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 216 | — | — | 1 | µS/cm | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 214 | — | — | 1 | µS/cm | Y | — | NQ | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 199 | — | — | 1 | µg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 200 | — | — | 1 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 200 | — | — | 1 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 197 | — | — | 1 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 199 | — | — | 1 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.0176 | 0.136 | 0.48 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.0606 | 0.0796 | 0.277 | — | pCi/L | Y | U | U | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.159 | 0.106 | 0.481 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.255 | 0.15 | 0.49 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0621 | 0.13 | 0.48 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 6.57 | — | — | 0.133 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 6.54 | — | — | 0.133 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 6.22 | — | — | 0.1 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 6.73 | — | — | 0.1 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 6.45 | — | — | 0.1 | mg/L | Y | — | J | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 171 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 117 | — | — | 3.4 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 133 | — | — | 3.4 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 143 | — | — | 2.4 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 140 | — | — | 2.4 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12485 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.333 | — | — | 0.33 | mg/L | Y | J | J | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.914 | — | — | 0.33 | mg/L | Y | J | J | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 0.547 | — | — | 0.33 | mg/L | Y | J | U | 12-72 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.58 | — | — | 0.33 | mg/L | Y | J | J | 10-4766 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/28/09 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.885 | — | — | 0.33 | mg/L | Y | J | J | 10-13 | CAWR-09-12484 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 3.129 | 1.071 | 3.049 | — | pCi/L | Y | — | U | 2015-4 | CAWR-14-86942 | ARSL |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 1.02 | 0.639 | 2.039 | — | pCi/L | Y | U | U | 2014-2713 | CAWR-13-42149 | ARSL |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.825 | 0.688 | 2.245 | — | pCi/L | Y | U | U | 2013-8 | CAWR-12-23436 | ARSL |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | -0.89 | 0.68 | 2.32 | — | pCi/L | Y | U | U | 12-75 | CAWR-11-27999 | ARSL |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 3.4776 | 0.7728 | 1.771 | — | pCi/L | N | — | R | 11-28 | CAWR-10-25418 | ARSL |
| Spring 1 | — | 09/27/10 | WG | UF | RE | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 2.8336 | 0.7406 | 1.771 | — | pCi/L | Y | — | NQ | 11-28 | CAWR-10-25418 | ARSL |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.84 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.55 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.06 | — | — | 0.067 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.16 | — | — | 0.067 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.39 | — | — | 0.05 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.42 | 0.0621 | 0.0675 | — | pCi/L | Y | — | NQ | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.79 | 0.0685 | 0.0321 | — | pCi/L | Y | — | NQ | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.42 | 0.0848 | 0.0801 | — | pCi/L | Y | — | NQ | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.23 | 0.11 | 0.063 | — | pCi/L | Y | — | NQ | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.44 | 0.13 | 0.072 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25418 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0298 | 0.011 | 0.0472 | — | pCi/L | Y | U | U | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0544 | 0.0147 | 0.0289 | — | pCi/L | Y | — | NQ | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0113 | 0.0159 | 0.0581 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0327 | 0.016 | 0.046 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0368 | 0.018 | 0.055 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.708 | 0.0439 | 0.036 | — | pCi/L | Y | — | NQ | 2014-4642 | CAWR-14-86942 | GELC |
| Spring 1 | — | 12/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.903 | 0.0485 | 0.0201 | — | pCi/L | Y | — | NQ | 2014-2663 | CAWR-13-42149 | GELC |
| Spring 1 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.806 | 0.0609 | 0.0545 | — | pCi/L | Y | — | NQ | 12-1573 | CAWR-12-23436 | GELC |
| Spring 1 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.6 | 0.066 | 0.074 | — | pCi/L | Y | — | NQ | 12-74 | CAWR-11-27999 | GELC |
| Spring 1 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.642 | 0.072 | 0.043 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25418 | GELC |
| Spring 1 | — | 09/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Vanadium | V | Y | 16.8 | — | — | 1 | µg/L | Y | — | NQ | 2014-4642 | CAWR-14-86969 | GELC |
| Spring 1 | — | 12/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 17 | — | — | 1 | µg/L | Y | — | NQ | 2014-2663 | CAWR-13-42163 | GELC |
| Spring 1 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 17 | — | — | 1 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23464 | GELC |
| Spring 1 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 16 | — | — | 1 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28001 | GELC |
| Spring 1 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 17.1 | — | — | 1 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25417 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.07 | — | — | 0.01 | SU | Y | H | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.96 | — | — | 0.01 | SU | Y | H | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.11 | — | — | 0.01 | SU | Y | H | J- | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.25 | — | — | 0.01 | SU | Y | H | J- | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.19 | — | — | 0.01 | SU | Y | H | J- | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 112 | — | — | 0.725 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 121 | — | — | 0.725 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 119 | — | — | 0.73 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 123 | — | — | 0.73 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 133 | — | — | 0.73 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0 | 0.00533 | 0.0557 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00996 | 0.00743 | 0.0453 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00206 | 0.0062 | 0.034 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.0033 | 0.005 | 0.034 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -0.02 | 0.007 | 0.034 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.127 | — | — | 0.017 | mg/L | Y | — | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.112 | — | — | 0.017 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0677 | — | — | 0.016 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.058 | — | — | 0.016 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.018 | — | — | 0.016 | mg/L | Y | J | J- | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 4.13 | — | — | 1.7 | µg/L | Y | J | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 10.7 | — | — | 1.7 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 8.52 | — | — | 1.7 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 7.7 | — | — | 1.5 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 13.2 | — | — | 1.5 | µg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Barium | Ba | Y | 23.4 | — | — | 1 | µg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 34.7 | — | — | 1 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 38 | — | — | 1 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 35.4 | — | — | 1 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 24.6 | — | — | 1 | µg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 09/29/14 | WG | UF | INIT | REG | SVOC | SW-846:8310 | Benzo(k)fluoranthene | 207-08-9 | Y | 0.0114 | — | — | 0.00909 | µg/L | Y | JP | J | 2014-4642 | CAWR-14-86943 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | SVOC | SW-846:8270C | Benzo(k)fluoranthene | 207-08-9 | N | 1.09 | — | — | 0.33 | µg/L | Y | U | U | 12-72 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | SVOC | SW-846:8270C | Benzo(k)fluoranthene | 207-08-9 | N | 1.12 | — | — | 0.23 | µg/L | Y | U | U | 10-13 | CAWR-09-12489 | GELC |
| Spring 2 | — | 09/29/08 | WG | UF | INIT | REG | SVOC | SW-846:8270C | Benzo(k)fluoranthene | 207-08-9 | N | 1.09 | — | — | 0.22 | µg/L | Y | U | U | 08-2041 | CAWR-08-15476 | GELC |
| Spring 2 | — | 04/29/08 | WG | UF | INIT | REG | SVOC | SW-846:8270C | Benzo(k)fluoranthene | 207-08-9 | N | 1.09 | — | — | 0.22 | µg/L | Y | U | U | 08-1082 | CAWR-08-12092 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Boron | B | Y | 41.2 | — | — | 15 | µg/L | Y | J | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 50.2 | — | — | 15 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 44.9 | — | — | 15 | µg/L | Y | J | J | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 48.8 | — | — | 15 | µg/L | Y | J | J | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 44.1 | — | — | 15 | µg/L | Y | J | J | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 14.6 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 16.8 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 18.9 | — | — | 0.05 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 18.9 | — | — | 0.05 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 17.5 | — | — | 0.05 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.78 | 1.96 | 6.47 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.828 | 1.54 | 5.47 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 1.35 | 1.4 | 5.5 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 2.37 | 1.5 | 5.4 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.0913 | 1.3 | 4.1 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.98 | — | — | 0.067 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.66 | — | — | 0.067 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.91 | — | — | 0.066 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.94 | — | — | 0.066 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 2.92 | — | — | 0.066 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | Y | 3.6 | — | — | 2 | µg/L | Y | J | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | N | 10 | — | — | 2 | µg/L | Y | U | U | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | N | 10 | — | — | 2 | µg/L | Y | U | U | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | N | 10 | — | — | 2.5 | µg/L | Y | U | U | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Chromium | Cr | N | 10 | — | — | 2.5 | µg/L | Y | U | U | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.0359 | 1.97 | 6.48 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 1.07 | 1.62 | 6.49 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -1.08 | 1.6 | 5.9 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.309 | 1.4 | 4.7 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -2.03 | 1.3 | 3.6 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.479 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.461 | — | — | 0.033 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.526 | — | — | 0.033 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.534 | — | — | 0.033 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.734 | — | — | 0.033 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 3.25 | 0.627 | 1.77 | — | pCi/L | Y | — | NQ | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 2.07 | 0.94 | 2.63 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 2.98 | 1 | 2.2 | — | pCi/L | Y | — | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | Y | 7.35 | 1.9 | 2.8 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.839 | 0.72 | 2.6 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 5.72 | 0.612 | 1.81 | — | pCi/L | Y | — | NQ | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 1.05 | 0.697 | 2.29 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.44 | 1 | 2.3 | — | pCi/L | Y | — | NQ | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 8.75 | 1.4 | 2.3 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 3.53 | 0.81 | 2 | — | pCi/L | Y | — | NQ | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 39.3 | — | — | 0.453 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 45.7 | — | — | 0.453 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 52.3 | — | — | 0.45 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 51.5 | — | — | 0.35 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 47.8 | — | — | 0.35 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Iron | Fe | Y | 55.1 | — | — | 30 | µg/L | Y | J | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Iron | Fe | Y | 60.8 | — | — | 30 | µg/L | Y | J | J | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Iron | Fe | Y | 60.8 | — | — | 30 | µg/L | Y | J | J | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Iron | Fe | Y | 78.2 | — | — | 30 | µg/L | Y | J | J | 10-4767 | CAWR-10-25424 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Iron | Fe | Y | 38.5 | — | — | 30 | µg/L | Y | J | J | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 0.702 | — | — | 0.11 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 0.905 | — | — | 0.11 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.25 | — | — | 0.11 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 1.06 | — | — | 0.085 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 0.982 | — | — | 0.085 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Manganese | Mn | Y | 9.41 | — | — | 2 | µg/L | Y | J | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 203 | — | — | 2 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 112 | — | — | 2 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 51.3 | — | — | 2 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Manganese | Mn | Y | 10.1 | — | — | 2 | µg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 3.14 | — | — | 0.165 | µg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.67 | — | — | 0.165 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.51 | — | — | 0.17 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.54 | — | — | 0.1 | µg/L | Y | — | J | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.65 | — | — | 0.1 | µg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -3.16 | 3.77 | 12.7 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -3.16 | 3.34 | 11.2 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -0.613 | 3.2 | 11 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 0.772 | 2.9 | 9.4 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 7.87 | 10 | 33 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.154 | — | — | 0.017 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.25 | — | — | 0.05 | mg/L | Y | U | U | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.25 | — | — | 0.05 | mg/L | Y | U | U | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.25 | — | — | 0.05 | mg/L | Y | U | U | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 0.169 | — | — | 0.05 | µg/L | Y | J | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | N | 0.2 | — | — | 0.05 | µg/L | Y | U | U | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | N | 0.2 | — | — | 0.05 | µg/L | Y | U | U | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | N | 0.2 | — | — | 0.05 | µg/L | Y | U | U | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | N | 0.2 | — | — | 0.05 | µg/L | Y | U | U | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00625 | 0.00644 | 0.0311 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00785 | 0.00961 | 0.0447 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.0019 | 0.033 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00535 | 0.0046 | 0.03 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00171 | 0.0017 | 0.029 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.011 | 0.00609 | 0.0461 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0118 | 0.0118 | 0.053 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00568 | 0.0033 | 0.032 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.0107 | 0.0076 | 0.052 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00171 | 0.0017 | 0.028 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.13 | — | — | 0.05 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.92 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.12 | — | — | 0.05 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.94 | — | — | 0.05 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 1.66 | — | — | 0.05 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 7.7 | 18.8 | 72.8 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 5.15 | 19 | 76.8 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -3.06 | 17 | 70 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -7.47 | 21 | 70 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -43.9 | 17 | 48 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 31.6 | — | — | 0.053 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 37.9 | — | — | 0.053 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 34.1 | — | — | 0.053 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 34.7 | — | — | 0.053 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 34 | — | — | 0.053 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Sodium | Na | Y | 39.6 | — | — | 0.1 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 38.4 | — | — | 0.1 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 37.6 | — | — | 0.1 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 38.5 | — | — | 0.1 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 43.5 | — | — | 0.1 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 1.43 | 1.58 | 6.63 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.48 | 1.23 | 4.28 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 1.59 | 1.4 | 6 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.28 | 1.4 | 4.6 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 1.11 | 1.1 | 4 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 223 | — | — | 3.63 | µS/cm | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 245 | — | — | 1 | µS/cm | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 259 | — | — | 1 | µS/cm | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 268 | — | — | 1 | µS/cm | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 263 | — | — | 1 | µS/cm | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 186 | — | — | 1 | µg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 188 | — | — | 1 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 204 | — | — | 1 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 195 | — | — | 1 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 184 | — | — | 1 | µg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.183 | 0.127 | 0.495 | — | pCi/L | Y | U | U | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0215 | 0.129 | 0.489 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.171 | 0.15 | 0.49 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.27 | 0.15 | 0.48 | — | pCi/L | Y | U | U | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.0766 | 0.083 | 0.29 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 7.04 | — | — | 0.133 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 3.92 | — | — | 0.133 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 4.28 | — | — | 0.1 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 4.13 | — | — | 0.1 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 4.05 | — | — | 0.1 | mg/L | Y | — | J | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 113 | — | — | 3.4 | mg/L | Y | — | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 143 | — | — | 3.4 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 170 | — | — | 3.4 | mg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 172 | — | — | 2.4 | mg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 172 | — | — | 2.4 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.21 | — | — | 0.033 | mg/L | Y | — | NQ | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.373 | — | — | 0.035 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | N | 0.1 | — | — | 0.035 | mg/L | Y | U | U | 12-72 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.416 | — | — | 0.033 | mg/L | Y | — | J- | 10-4766 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | TKN | Y | 0.119 | — | — | 0.033 | mg/L | Y | — | J+ | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.23 | — | — | 0.33 | mg/L | Y | — | J- | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 2.36 | — | — | 0.33 | mg/L | Y | — | NQ | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 1.78 | — | — | 0.33 | mg/L | Y | — | U | 12-72 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 3 | — | — | 0.66 | mg/L | Y | — | NQ | 10-4766 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.81 | — | — | 0.33 | mg/L | Y | — | NQ | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | -0.94 | 0.799 | 2.75 | — | pCi/L | Y | U | U | 2015-197 | CAWR-14-89231 | ARSL |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.189 | 0.671 | 2.266 | — | pCi/L | Y | U | U | 2013-8 | CAWR-12-23437 | ARSL |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | -0.57 | 0.62 | 2.12 | — | pCi/L | Y | U | U | 12-75 | CAWR-11-28002 | ARSL |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 5.2808 | 1.1914 | 2.737 | — | pCi/L | N | — | R | 11-28 | CAWR-10-25422 | ARSL |
| Spring 2 | — | 09/27/10 | WG | UF | RE | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 3.864 | 1.0626 | 2.737 | — | pCi/L | Y | — | U | 11-28 | CAWR-10-25422 | ARSL |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | N | 0.644 | 0.2898 | 0.2898 | — | pCi/L | Y | — | U | 10-20 | CAWR-09-12490 | UMTL |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 3.08 | — | — | 0.067 | µg/L | Y | — | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.1 | — | — | 0.067 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.61 | — | — | 0.067 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.68 | — | — | 0.05 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.59 | — | — | 0.05 | µg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 2.01 | 0.0843 | 0.0719 | — | pCi/L | Y | — | NQ | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.745 | 0.0547 | 0.0659 | — | pCi/L | Y | — | NQ | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.897 | 0.094 | 0.076 | — | pCi/L | Y | — | J+ | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.67 | 0.14 | 0.045 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.868 | 0.08 | 0.1 | — | pCi/L | Y | — | NQ | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0651 | 0.0189 | 0.0626 | — | pCi/L | Y | — | NQ | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0185 | 0.0131 | 0.0478 | — | pCi/L | Y | U | U | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0283 | 0.015 | 0.056 | — | pCi/L | Y | U | U | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0465 | 0.013 | 0.035 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0211 | 0.011 | 0.052 | — | pCi/L | Y | U | U | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 1.15 | 0.0639 | 0.0689 | — | pCi/L | Y | — | NQ | 2015-187 | CAWR-14-89231 | GELC |
| Spring 2 | — | 09/24/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.427 | 0.0404 | 0.0448 | — | pCi/L | Y | — | NQ | 12-1573 | CAWR-12-23437 | GELC |
| Spring 2 | — | 10/11/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.526 | 0.065 | 0.089 | — | pCi/L | Y | — | J+ | 12-74 | CAWR-11-28002 | GELC |
| Spring 2 | — | 09/27/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.929 | 0.083 | 0.027 | — | pCi/L | Y | — | NQ | 10-4767 | CAWR-10-25422 | GELC |
| Spring 2 | — | 09/28/09 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.5 | 0.052 | 0.062 | — | pCi/L | Y | — | NQ | 10-13 | CAWR-09-12490 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Vanadium | V | Y | 26.6 | — | — | 1 | µg/L | Y | — | NQ | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.45 | — | — | 1 | µg/L | Y | — | NQ | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 9.2 | — | — | 1 | µg/L | Y | — | NQ | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.47 | — | — | 1 | µg/L | Y | — | NQ | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.97 | — | — | 1 | µg/L | Y | — | NQ | 10-13 | CAWR-09-12488 | GELC |
| Spring 2 | — | 10/29/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Zinc | Zn | Y | 5.61 | — | — | 3.3 | µg/L | Y | J | J | 2015-187 | CAWR-14-89235 | GELC |
| Spring 2 | — | 09/24/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 12-1573 | CAWR-12-23465 | GELC |
| Spring 2 | — | 10/11/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 12-73 | CAWR-11-28003 | GELC |
| Spring 2 | — | 09/27/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 10-4767 | CAWR-10-25424 | GELC |
| Spring 2 | — | 09/28/09 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Zinc | Zn | N | 10 | — | — | 3.3 | µg/L | Y | U | U | 10-13 | CAWR-09-12488 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 8.05 | — | — | 0.01 | SU | Y | H | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.22 | — | — | 0.01 | SU | Y | H | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.15 | — | — | 0.01 | SU | Y | H | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.34 | — | — | 0.01 | SU | Y | H | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.01 | — | — | 0.01 | SU | Y | H | J- | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.18 | — | — | 0.01 | SU | Y | H | J- | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 203 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 200 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 157 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 174 | — | — | 0.725 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 174 | — | — | 0.73 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 171 | — | — | 0.73 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00315 | 0.00577 | 0.0418 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00907 | 0.013 | 0.0478 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00862 | 0.00643 | 0.0437 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00557 | 0.00491 | 0.0334 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.0123 | 0.0068 | 0.024 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | -4.16E-05 | 0.0016 | 0.033 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 2014-3574 | CALA-14-79464 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0509 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.05 | — | — | 0.017 | mg/L | Y | U | U | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.05 | — | — | 0.016 | mg/L | Y | U | U | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.05 | — | — | 0.016 | mg/L | Y | U | U | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Barium | Ba | Y | 179 | — | — | 1 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Barium | Ba | Y | 181 | — | — | 1 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 118 | — | — | 1 | µg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 130 | — | — | 1 | µg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 150 | — | — | 1 | µg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 159 | — | — | 1 | µg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Boron | B | Y | 66.7 | — | — | 15 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Boron | B | Y | 68.8 | — | — | 15 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 59.4 | — | — | 15 | µg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 63.5 | — | — | 15 | µg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 72.1 | — | — | 15 | µg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 86.3 | — | — | 15 | µg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.248 | — | — | 0.067 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.242 | — | — | 0.067 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.124 | — | — | 0.067 | mg/L | Y | J | J | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.123 | — | — | 0.067 | mg/L | Y | J | J | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.165 | — | — | 0.066 | mg/L | Y | J | J | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.167 | — | — | 0.066 | mg/L | Y | J | J | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 64 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 63.4 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 41 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 46.7 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 52.3 | — | — | 0.05 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 51.2 | — | — | 0.05 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -1.07 | 1.27 | 4.29 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.482 | 1.56 | 5.16 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 1.83 | 1.02 | 3.86 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.0105 | 1.3 | 4.71 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 3.15 | 1.7 | 6.2 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.659 | 1.2 | 4 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 43.4 | — | — | 0.67 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 44.1 | — | — | 0.67 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 18.8 | — | — | 0.335 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 25.7 | — | — | 0.134 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 30.1 | — | — | 0.33 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 29.9 | — | — | 0.66 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.184 | 1.38 | 4.98 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -1.45 | 1.51 | 5.4 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -1.47 | 1.27 | 3.47 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 1.32 | 1.28 | 5.21 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 3.72 | 1.8 | 6.8 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -0.762 | 1.4 | 4.1 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.299 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.319 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.452 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.427 | — | — | 0.033 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.389 | — | — | 0.033 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.42 | — | — | 0.033 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.213 | 0.559 | 1.95 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | EPA:900 | Gross alpha | GROSSA | N | -0.219 | 0.633 | 2.25 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.233 | 0.512 | 2.44 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 3.09 | 1.05 | 2.93 | — | pCi/L | Y | — | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 1.66 | 0.88 | 2.5 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.962 | 0.97 | 3.4 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 1.15 | 0.556 | 1.79 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | EPA:900 | Gross beta | GROSSB | Y | 1.95 | 0.558 | 1.65 | — | pCi/L | Y | — | NQ | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 3.32 | 0.567 | 1.76 | — | pCi/L | Y | — | NQ | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | N | 1.46 | 0.795 | 2.57 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 4.73 | 0.93 | 2.4 | — | pCi/L | Y | — | NQ | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 3.22 | 1 | 2.8 | — | pCi/L | Y | — | NQ | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 187 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 186 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 120 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 136 | — | — | 0.453 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 153 | — | — | 0.45 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 150 | — | — | 0.35 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 6.71 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 6.65 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 4.39 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 4.78 | — | — | 0.11 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 5.36 | — | — | 0.11 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 5.3 | — | — | 0.085 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 0.598 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 0.638 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.2 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | N | 0.5 | — | — | 0.165 | µg/L | Y | U | U | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.12 | — | — | 0.17 | µg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 1.19 | — | — | 0.1 | µg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 2.55 | 2.78 | 10.3 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 0.93 | 2.77 | 10.2 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -3.35 | 2.09 | 7.03 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -1.94 | 2.85 | 9.59 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 1.25 | 2.4 | 8.2 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 07/08/09 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 31.7 | 16 | 44 | — | pCi/L | Y | U | U | 09-2571 | CALA-09-11202 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.14 | — | — | 0.5 | µg/L | Y | J | J | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.19 | — | — | 0.5 | µg/L | Y | J | J | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.71 | — | — | 0.5 | µg/L | Y | J | J | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 17.8 | — | — | 0.5 | µg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.72 | — | — | 0.5 | µg/L | Y | J | J | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.38 | — | — | 0.5 | µg/L | Y | J | J | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.496 | — | — | 0.017 | mg/L | Y | — | J | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.054 | — | — | 0.017 | mg/L | Y | — | U | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.0259 | — | — | 0.017 | mg/L | Y | J | J | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.25 | — | — | 0.085 | mg/L | Y | U | U | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 0.0985 | — | — | 0.05 | mg/L | Y | J | J- | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | N | 0.176 | — | — | 0.05 | mg/L | Y | J | U | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00518 | 0.00518 | 0.0268 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00229 | 0.00397 | 0.0236 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00253 | 0.0076 | 0.0237 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.0105 | 0.0114 | 0.0382 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00221 | 0.0038 | 0.033 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0 | 0.0036 | 0.02 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0104 | 0.00733 | 0.051 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0137 | 0.00793 | 0.045 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.038 | 0.0141 | 0.0499 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00176 | 0.00634 | 0.0293 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00442 | 0.0063 | 0.046 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00361 | 0.0051 | 0.029 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.93 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Potassium | K | Y | 2.9 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.44 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.59 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 2.95 | — | — | 0.05 | mg/L | Y | E | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 3.33 | — | — | 0.05 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -1.52 | 17.4 | 69.4 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -9.74 | 14.5 | 58.5 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 1.34 | 12.9 | 34.3 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 5.31 | 15.8 | 60.2 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 4.7 | 20 | 71 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 19.9 | 17 | 62 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 62.5 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 63.2 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 58.4 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 56.2 | — | — | 0.053 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 59.2 | — | — | 0.053 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 65.3 | — | — | 0.053 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Sodium | Na | Y | 47.3 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Sodium | Na | Y | 46.9 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 37 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 36.5 | — | — | 0.1 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 39.1 | — | — | 0.1 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 40.8 | — | — | 0.1 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.45 | 1.05 | 3.46 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -3.41 | 1.4 | 3.81 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 0.129 | 1.06 | 3.39 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.57 | 1.51 | 5.14 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 1.05 | 1.4 | 5 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -0.801 | 1.3 | 3.9 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 574 | — | — | 1 | µS/cm | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 577 | — | — | 1 | µS/cm | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 412 | — | — | 1 | µS/cm | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 440 | — | — | 1 | µS/cm | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 455 | — | — | 1 | µS/cm | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 465 | — | — | 1 | µS/cm | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 532 | — | — | 1 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 533 | — | — | 1 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 357 | — | — | 1 | µg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 395 | — | — | 1 | µg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 416 | — | — | 1 | µg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 448 | — | — | 1 | µg/L | Y | E | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.123 | 0.112 | 0.387 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0948 | 0.113 | 0.397 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.0592 | 0.13 | 0.49 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.00266 | 0.138 | 0.489 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | -0.0168 | 0.14 | 0.51 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.175 | 0.13 | 0.46 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 20 | — | — | 0.133 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 19.9 | — | — | 0.133 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 16.4 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 17.5 | — | — | 0.133 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 17.8 | — | — | 0.1 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 20.3 | — | — | 0.1 | mg/L | Y | — | J+ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 377 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 351 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 256 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 303 | — | — | 3.4 | mg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 319 | — | — | 2.4 | mg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 336 | — | — | 2.4 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.35 | — | — | 0.33 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.46 | — | — | 0.33 | mg/L | Y | — | NQ | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.766 | — | — | 0.33 | mg/L | Y | J | J | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.812 | — | — | 0.33 | mg/L | Y | J | J | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | N | 0.689 | — | — | 0.33 | mg/L | Y | J | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.22 | — | — | 0.33 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.032 | — | — | 0.017 | mg/L | Y | J | J | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.0257 | — | — | 0.017 | mg/L | Y | J | J | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.0382 | — | — | 0.017 | mg/L | Y | J | J | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | N | 0.139 | — | — | 0.017 | mg/L | Y | — | U | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | N | 0.0462 | — | — | 0.015 | mg/L | Y | J | U | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.064 | — | — | 0.015 | mg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.85 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.87 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.43 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | N | 0.2 | — | — | 0.067 | µg/L | Y | U | U | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.89 | — | — | 0.067 | µg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.35 | — | — | 0.05 | µg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.1 | 0.0522 | 0.0628 | — | pCi/L | Y | — | NQ | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.18 | 0.0568 | 0.0699 | — | pCi/L | Y | — | NQ | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.61 | 0.0472 | 0.0793 | — | pCi/L | Y | — | NQ | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.13 | 0.0525 | 0.058 | — | pCi/L | Y | — | NQ | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.754 | 0.072 | 0.062 | — | pCi/L | Y | — | NQ | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.629 | 0.061 | 0.072 | — | pCi/L | Y | — | NQ | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.045 | 0.0131 | 0.0526 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0334 | 0.0125 | 0.0586 | — | pCi/L | Y | U | U | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0178 | 0.0126 | 0.0617 | — | pCi/L | Y | U | U | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0295 | 0.0102 | 0.0335 | — | pCi/L | Y | U | U | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0313 | 0.011 | 0.033 | — | pCi/L | Y | U | U | 11-2719 | CALA-11-14674 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.0199 | 0.0095 | 0.036 | — | pCi/L | Y | U | U | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.743 | 0.0427 | 0.0353 | — | pCi/L | Y | — | NQ | 2014-3574 | CALA-14-79458 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | UF | INIT | FD | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.708 | 0.0441 | 0.0392 | — | pCi/L | Y | — | NQ | 2014-3574 | CALA-14-79447 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.44 | 0.0408 | 0.0507 | — | pCi/L | Y | — | NQ | 2013-951 | CALA-13-33423 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.672 | 0.0405 | 0.0373 | — | pCi/L | Y | — | NQ | 12-1203 | CALA-12-12549 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.473 | 0.051 | 0.037 | — | pCi/L | Y | — | NQ | 11-2719 | CALA-11-14674 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLAO-4 | 5.24 | 08/26/10 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.448 | 0.047 | 0.032 | — | pCi/L | Y | — | NQ | 10-4371 | CALA-10-25247 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Vanadium | V | Y | 7.76 | — | — | 1 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79464 | GELC |
| LLAO-4 | 5.24 | 06/17/14 | WG | F | INIT | FD | INORGANIC | SW-846:6010C | Vanadium | V | Y | 8.01 | — | — | 1 | µg/L | Y | — | NQ | 2014-3574 | CALA-14-79448 | GELC |
| LLAO-4 | 5.24 | 06/12/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.92 | — | — | 1 | µg/L | Y | — | NQ | 2013-951 | CALA-13-33431 | GELC |
| LLAO-4 | 5.24 | 04/09/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 6.98 | — | — | 1 | µg/L | Y | — | NQ | 12-1203 | CALA-12-12554 | GELC |
| LLAO-4 | 5.24 | 06/21/11 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 7.55 | — | — | 1 | µg/L | Y | — | NQ | 11-2719 | CALA-11-14675 | GELC |
| LLAO-4 | 5.24 | 08/26/10 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.79 | — | — | 1 | µg/L | Y | — | NQ | 10-4370 | CALA-10-25246 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.86 | — | — | 0.01 | SU | Y | H | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.62 | — | — | 0.01 | SU | Y | H | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.7 | — | — | 0.01 | SU | Y | H | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.44 | — | — | 0.01 | SU | Y | H | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:150.1 | Acidity or Alkalinity of a solution | pH | Y | 7.58 | — | — | 0.01 | SU | Y | H | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 83.3 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 80.4 | — | — | 0.725 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 84.3 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 86.5 | — | — | 0.725 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:310.1 | Alkalinity-CO3+HCO3 | ALK-CO3+HCO3 | Y | 86.5 | — | — | 0.725 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00199 | 0.00596 | 0.0368 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00284 | 0.00492 | 0.0432 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0 | 0.00758 | 0.0297 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.00612 | 0.0079 | 0.037 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | HASL-300:AM-241 | Americium-241 | Am-241 | N | 0.0132 | 0.005 | 0.014 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0605 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.0305 | — | — | 0.017 | mg/L | Y | J | U | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | Y | 0.0476 | — | — | 0.017 | mg/L | Y | J | J+ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.0375 | — | — | 0.017 | mg/L | Y | J | U | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | NH3-N | N | 0.05 | — | — | 0.016 | mg/L | Y | U | U | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | Y | 1.81 | — | — | 1.7 | µg/L | Y | J | J | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | N | 5 | — | — | 1.7 | µg/L | Y | U | U | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | N | 5 | — | — | 1.7 | µg/L | Y | U | U | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | N | 5 | — | — | 1.7 | µg/L | Y | U | U | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Arsenic | As | N | 5 | — | — | 1.7 | µg/L | Y | U | U | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Barium | Ba | Y | 42.6 | — | — | 1 | µg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 49.6 | — | — | 1 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 47.8 | — | — | 1 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 49.9 | — | — | 1 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Barium | Ba | Y | 51.7 | — | — | 1 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Boron | B | Y | 23.4 | — | — | 15 | µg/L | Y | J | J | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 27.4 | — | — | 15 | µg/L | Y | J | J | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 26.7 | — | — | 15 | µg/L | Y | J | J | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 37.9 | — | — | 15 | µg/L | Y | J | J | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Boron | B | Y | 38.3 | — | — | 15 | µg/L | Y | J | J | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.181 | — | — | 0.067 | mg/L | Y | J | J | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.159 | — | — | 0.067 | mg/L | Y | J | J | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.142 | — | — | 0.067 | mg/L | Y | J | J | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.146 | — | — | 0.067 | mg/L | Y | J | J | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Bromide | Br(-1) | Y | 0.19 | — | — | 0.067 | mg/L | Y | J | J | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Calcium | Ca | Y | 27.6 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 27.9 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 27.9 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 30.4 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Calcium | Ca | Y | 28.4 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -1.61 | 1.49 | 5.37 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.92 | 0.955 | 3.66 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | 0.633 | 1.58 | 5.86 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -2.59 | 1.7 | 5.7 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cesium-137 | Cs-137 | N | -0.485 | 2 | 6.4 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 15.5 | — | — | 0.335 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 17.5 | — | — | 0.335 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 16 | — | — | 0.335 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 18.9 | — | — | 0.067 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Chloride | Cl(-1) | Y | 18.5 | — | — | 0.067 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -0.482 | 1.3 | 4.79 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -0.381 | 0.885 | 3.3 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | -1.57 | 1.36 | 4.65 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 0.0056 | 1.4 | 5.4 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Cobalt-60 | Co-60 | N | 2.89 | 2.1 | 8 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.693 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.486 | — | — | 0.033 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.485 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.467 | — | — | 0.033 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | F(-1) | Y | 0.438 | — | — | 0.033 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.905 | 0.447 | 1.45 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.818 | 0.801 | 2.97 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 1.02 | 0.827 | 2.9 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 0.999 | 0.79 | 2.7 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross alpha | GROSSA | N | 1.11 | 0.82 | 2.6 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 5.79 | 0.74 | 1.66 | — | pCi/L | Y | — | NQ | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 7.04 | 0.504 | 1.32 | — | pCi/L | Y | — | NQ | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 3.15 | 0.979 | 2.92 | — | pCi/L | Y | — | NQ | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 5.09 | 1.1 | 2.5 | — | pCi/L | Y | — | NQ | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | EPA:900 | Gross beta | GROSSB | Y | 5.31 | 1.1 | 2.9 | — | pCi/L | Y | — | NQ | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 101 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 102 | — | — | 0.453 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 102 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 111 | — | — | 0.453 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SM:A2340B | Hardness | HARDNESS | Y | 104 | — | — | 0.453 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Magnesium | Mg | Y | 7.75 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.86 | — | — | 0.11 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.76 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 8.47 | — | — | 0.11 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Magnesium | Mg | Y | 7.95 | — | — | 0.11 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.33 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.22 | — | — | 0.165 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.3 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.47 | — | — | 0.165 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Molybdenum | Mo | Y | 2.34 | — | — | 0.165 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 0.231 | 2.73 | 9.59 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -2.36 | 1.97 | 6.64 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -1.03 | 2.92 | 9.99 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | -6.02 | 3.5 | 11 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Neptunium-237 | Np-237 | N | 6.19 | 4.1 | 14 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 0.604 | — | — | 0.5 | µg/L | Y | J | J | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 0.804 | — | — | 0.5 | µg/L | Y | J | J | 2014-2698 | CALA-14-46054 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.31 | — | — | 0.5 | µg/L | Y | J | J | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.64 | — | — | 0.5 | µg/L | Y | J | J | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Nickel | Ni | Y | 1.17 | — | — | 0.5 | µg/L | Y | J | J | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 3.44 | — | — | 0.17 | mg/L | Y | — | J | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 3.6 | — | — | 0.085 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 3.78 | — | — | 0.17 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 3.53 | — | — | 0.17 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | NO3+NO2-N | Y | 4.35 | — | — | 0.05 | mg/L | Y | — | NQ | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.89 | — | — | 0.5 | µg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.66 | — | — | 0.5 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.48 | — | — | 0.5 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.38 | — | — | 0.5 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | LCMS/MS PERCHLORATE | SW-846:6850 | Perchlorate | ClO4 | Y | 5.25 | — | — | 0.5 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | 0.00247 | 0.00499 | 0.0275 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -4.24E-10 | 0.00509 | 0.0238 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00593 | 0.00593 | 0.043 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.00229 | 0.004 | 0.027 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-238 | Pu-238 | N | -0.0114 | 0.006 | 0.039 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0102 | 0.00932 | 0.053 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.0153 | 0.00881 | 0.0501 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00791 | 0.0074 | 0.033 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | 0.00686 | 0.0051 | 0.029 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOPU | Plutonium-239/240 | Pu-239/240 | N | -0.00454 | 0.0056 | 0.056 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Potassium | K | Y | 4.49 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 5.27 | — | — | 0.05 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 4.66 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 5.23 | — | — | 0.05 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Potassium | K | Y | 5.43 | — | — | 0.05 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 11.6 | 16.4 | 63.1 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | 3.19 | 14 | 48.3 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -20 | 18.4 | 67.4 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -5.42 | 20 | 77 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Potassium-40 | K-40 | N | -0.0819 | 27 | 100 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Silicon Dioxide | SiO2 | Y | 40.2 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 45.3 | — | — | 0.053 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 42.4 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 46.9 | — | — | 0.053 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Silicon Dioxide | SiO2 | Y | 46.3 | — | — | 0.053 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Sodium | Na | Y | 14.4 | — | — | 0.1 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 18.1 | — | — | 0.1 | mg/L | Y | N | J+ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 16 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 18.2 | — | — | 0.1 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Sodium | Na | Y | 18.1 | — | — | 0.1 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 0.0431 | 1.08 | 4.25 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.58 | 1.06 | 3.38 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | -1.95 | 1.54 | 5.22 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 2.82 | 1.7 | 7.3 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | EPA:901.1 | Sodium-22 | Na-22 | N | 1.93 | 1.7 | 6.5 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 299 | — | — | 1 | µS/cm | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 309 | — | — | 1 | µS/cm | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 309 | — | — | 1 | µS/cm | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 311 | — | — | 1 | µS/cm | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:120.1 | Specific Conductance | SPEC_CONDC | Y | 303 | — | — | 1 | µS/cm | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Strontium | Sr | Y | 127 | — | — | 1 | µg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 139 | — | — | 1 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 135 | — | — | 1 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 147 | — | — | 1 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Strontium | Sr | Y | 144 | — | — | 1 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0468 | 0.0967 | 0.357 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.00638 | 0.132 | 0.472 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.231 | 0.148 | 0.492 | — | pCi/L | Y | U | U | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.0986 | 0.14 | 0.48 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | EPA:905.0 | Strontium-90 | Sr-90 | N | 0.265 | 0.15 | 0.49 | — | pCi/L | Y | U | U | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 20.7 | — | — | 0.665 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.7 | — | — | 0.665 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.3 | — | — | 0.665 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.4 | — | — | 0.133 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | SO4(-2) | Y | 21.2 | — | — | 0.133 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 163 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 197 | — | — | 3.4 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 194 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 197 | — | — | 3.4 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | TDS | Y | 210 | — | — | 3.4 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.616 | — | — | 0.33 | mg/L | Y | J | J | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.31 | — | — | 0.33 | mg/L | Y | — | NQ | 2014-2698 | CALA-14-46053 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.959 | — | — | 0.33 | mg/L | Y | J | J | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 0.777 | — | — | 0.33 | mg/L | Y | J | J | 2013-409 | CALA-13-24549 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | TOC | Y | 1.19 | — | — | 0.33 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.0756 | — | — | 0.017 | mg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.317 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.259 | — | — | 0.017 | mg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.363 | — | — | 0.017 | mg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | F | INIT | REG | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | PO4-P | Y | 0.438 | — | — | 0.015 | mg/L | Y | — | J | 12-500 | CAWR-12-1757 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 56.855 | 16.915 | 1.95 | — | pCi/L | Y | — | J- | 2014-3585 | CALA-14-79460 | ARSL |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 55.25 | 8.44 | 2.7 | — | pCi/L | Y | — | J- | 2013-948 | CALA-13-33427 | ARSL |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 62.506 | 9.487 | 2.189 | — | pCi/L | Y | — | NQ | 12-1208 | CALA-12-12546 | ARSL |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 60.51 | 9.71 | 8.18 | — | pCi/L | Y | — | NQ | 12-511 | CAWR-12-1756 | ARSL |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | Generic:Low_Level_Tri | Tritium | H-3 | Y | 62.7256 | 9.499 | 2.1896 | — | pCi/L | Y | — | NQ | 11-3081 | CAWR-11-23212 | ARSL |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.98 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.58 | — | — | 0.067 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.06 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 2.16 | — | — | 0.067 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6020 | Uranium | U | Y | 1.74 | — | — | 0.067 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 1.2 | 0.0556 | 0.0656 | — | pCi/L | Y | — | NQ | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.977 | 0.0552 | 0.0665 | — | pCi/L | Y | — | NQ | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.854 | 0.0487 | 0.0654 | — | pCi/L | Y | — | J | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.782 | 0.069 | 0.059 | — | pCi/L | Y | — | NQ | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-234 | U-234 | Y | 0.985 | 0.081 | 0.04 | — | pCi/L | Y | — | NQ | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.047 | 0.0129 | 0.055 | — | pCi/L | Y | U | U | 2014-3584 | CALA-14-79460 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.015 | 0.00916 | 0.0517 | — | pCi/L | Y | U | U | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0399 | 0.0124 | 0.0378 | — | pCi/L | Y | — | NQ | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | N | 0.00552 | 0.0078 | 0.033 | — | pCi/L | Y | U | U | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-235/236 | U-235/236 | Y | 0.0312 | 0.0096 | 0.025 | — | pCi/L | Y | — | NQ | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.674 | 0.0418 | 0.0368 | — | pCi/L | Y | — | NQ | 2014-3584 | CALA-14-79460 | GELC |

**Table C-2 San Ildefonso Pueblo General Surveillance Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available**

| Location | Depth (ft) | Date | Field Matrix | Field Prep | Lab Sample Type | Field QC Type | Suite | Method | Analyte | Analyte Code | Detect Flag | Result | 1-sigma TPU | MDA | MDL | Unit | Best Value Flag | Lab Qual | 2nd Qual | Request | Sample | Lab |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | — | 06/11/13 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.669 | 0.0454 | 0.0425 | — | pCi/L | Y | — | NQ | 2013-947 | CALA-13-33427 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.548 | 0.0386 | 0.0421 | — | pCi/L | Y | — | J | 12-1209 | CALA-12-12546 | GELC |
| Vine Tree Spring | — | 12/12/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.456 | 0.045 | 0.032 | — | pCi/L | Y | — | NQ | 12-500 | CAWR-12-1756 | GELC |
| Vine Tree Spring | — | 08/08/11 | WG | UF | INIT | REG | RAD | HASL-300:ISOU | Uranium-238 | U-238 | Y | 0.519 | 0.048 | 0.031 | — | pCi/L | Y | — | NQ | 11-3080 | CAWR-11-23212 | GELC |
| Vine Tree Spring | — | 06/18/14 | WG | F | INIT | REG | INORGANIC | SW-846:6010C | Vanadium | V | Y | 6.94 | — | — | 1 | µg/L | Y | — | NQ | 2014-3584 | CALA-14-79466 | GELC |
| Vine Tree Spring | — | 12/17/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.06 | — | — | 1 | µg/L | Y | — | NQ | 2014-2698 | CALA-14-46054 | GELC |
| Vine Tree Spring | — | 06/11/13 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 6.63 | — | — | 1 | µg/L | Y | — | NQ | 2013-947 | CALA-13-33435 | GELC |
| Vine Tree Spring | — | 12/12/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 8.4 | — | — | 1 | µg/L | Y | — | NQ | 2013-409 | CALA-13-24550 | GELC |
| Vine Tree Spring | — | 04/10/12 | WG | F | INIT | REG | INORGANIC | SW-846:6010B | Vanadium | V | Y | 7.51 | — | — | 1 | µg/L | Y | — | NQ | 12-1209 | CALA-12-12551 | GELC |

# Appendix D

*Groundwater Results Greater Than Half of Screening Levels*

| Zone | Location | Screen Top Depth (ft) | Sample Date | Analysis Suite | Parameter Name | Parameter Code | Field Prep Code | Analysis Type Code | Field Quality Control Code | Detect Flag | Report Result | Method Detection Limit | Uncertainty | Minimum Detectable Activity | Unit | Dilution Factor | Validation Qualifier | Validation Reason | Best Value Flag | Analytical Method | Lab ID | Screening Level | Reporting Level Code | Result/Screening Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intermediate Spring | Vine Tree Spring | —[a] | 12/17/13 | General Chemistry | Perchlorate | ClO4 | F[b] | INIT[c] | REG[d] | Y[e] | 5.66 | 0.5 | — | — | µg/L | 10 | NQ[f] | NQ | Y | SW-846:6850 | GELC[g] | 4 | Consent Order | 1.42 |
| Intermediate Spring | Vine Tree Spring | — | 06/18/14 | General Chemistry | Perchlorate | ClO4 | F | INIT | REG | Y | 5.89 | 0.5 | — | — | µg/L | 10 | NQ | NQ | Y | SW-846:6850 | GELC | 4 | Consent Order | 1.47 |
| Regional Spring | La Mesita Spring | — | 10/06/14 | Rad[h] | Gross alpha | GROSSA | UF[i] | INIT | REG | Y | 10.4 | — | 1.71 | 2.81 | pCi/L | 1 | NQ | NQ | Y | EPA:900 | GELC | 15 | EPA MCL[j] | 0.69 |
| Regional Spring | Sacred Spring | — | 10/30/14 | Metals | Manganese | Mn | F | INIT | REG | Y | 679 | 2 | — | — | µg/L | 1 | NQ | NQ | Y | SW-846:6010C | GELC | 200 | NMWQCC Groundwater Standard[k] | 3.40 |
| Regional Spring | Sacred Spring | — | 10/30/14 | Metals | Manganese | Mn | F | INIT | FD[l] | Y | 706 | 2 | — | — | µg/L | 1 | NQ | NQ | Y | SW-846:6010C | GELC | 200 | NMWQCC Groundwater Standard | 3.53 |
| Regional Spring | Spring 1 | — | 09/29/14 | Metals | Arsenic | As | F | INIT | REG | Y | 5.51 | 1.7 | — | — | µg/L | 1 | NQ | NQ | Y | SW-846:6020 | GELC | 10 | EPA MCL | 0.55 |
| Regional | R-34 | 883.7 | 05/09/14 | Metals | Arsenic | As | F | INIT | REG | Y | 6.74 | 1.7 | — | — | µg/L | 1 | NQ | NQ | Y | SW-846:6020 | GELC | 10 | EPA MCL | 0.67 |

[a] — = None.

[b] F = Filtered.

[c] INIT = Initial.

[d] REG = Regular.

[e] Y = Yes.

[f] NQ = Not qualified.

[g] GELC = General Engineering Laboratories, Inc., Charleston, SC.

[h] Rad = Radionuclides.

[i] UF = Unfiltered.

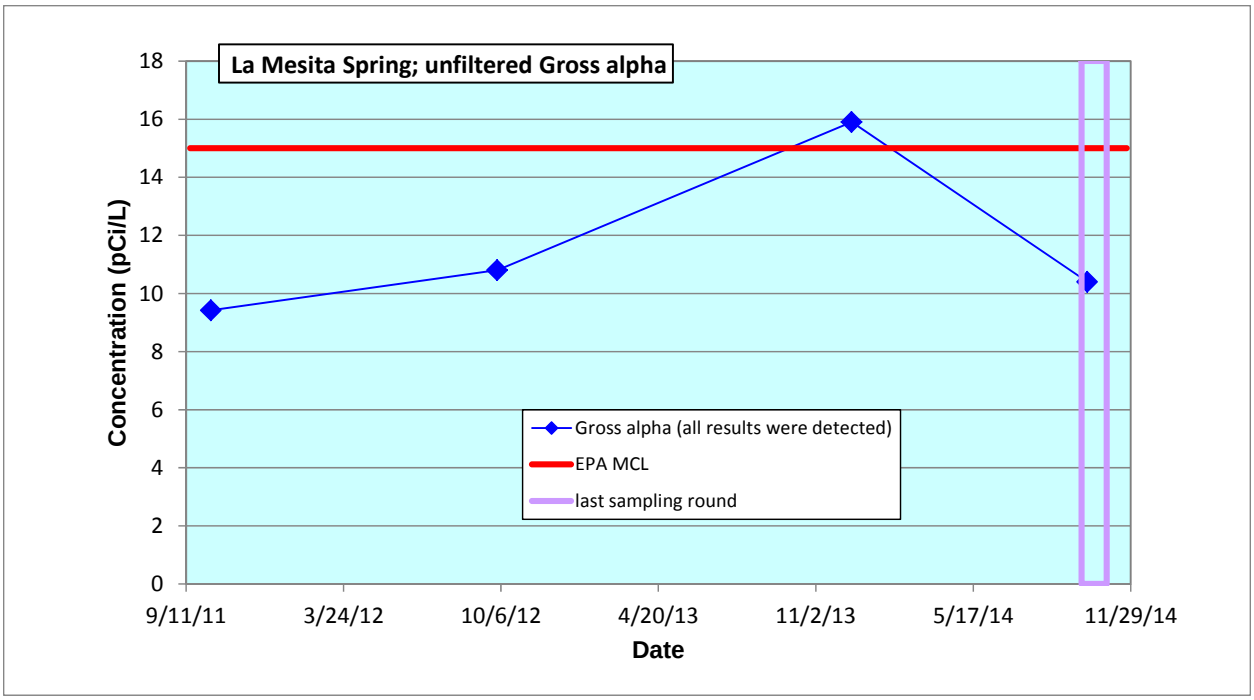
[j] EPA MCL = U.S. Environmental Protection Agency maximum contaminant level.

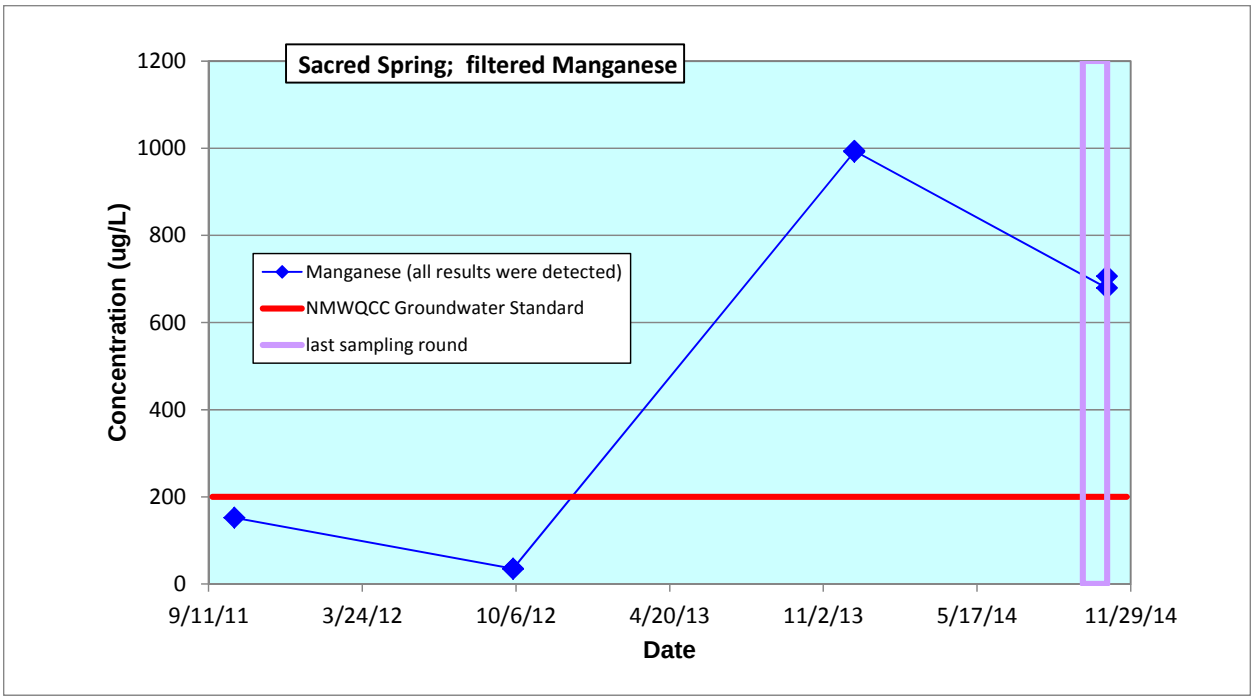
[k] NMWQCC Groundwater Standard = New Mexico Water Quality Control Commission groundwater standard.

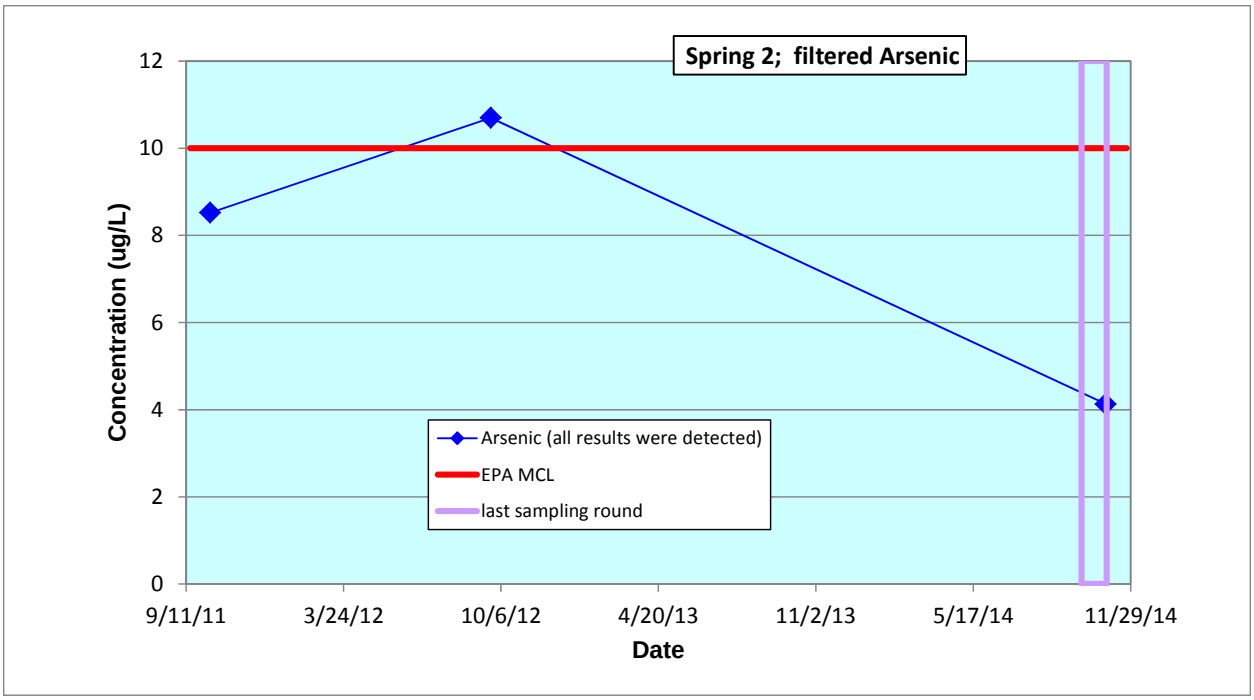
[l] FD = Field duplicate.

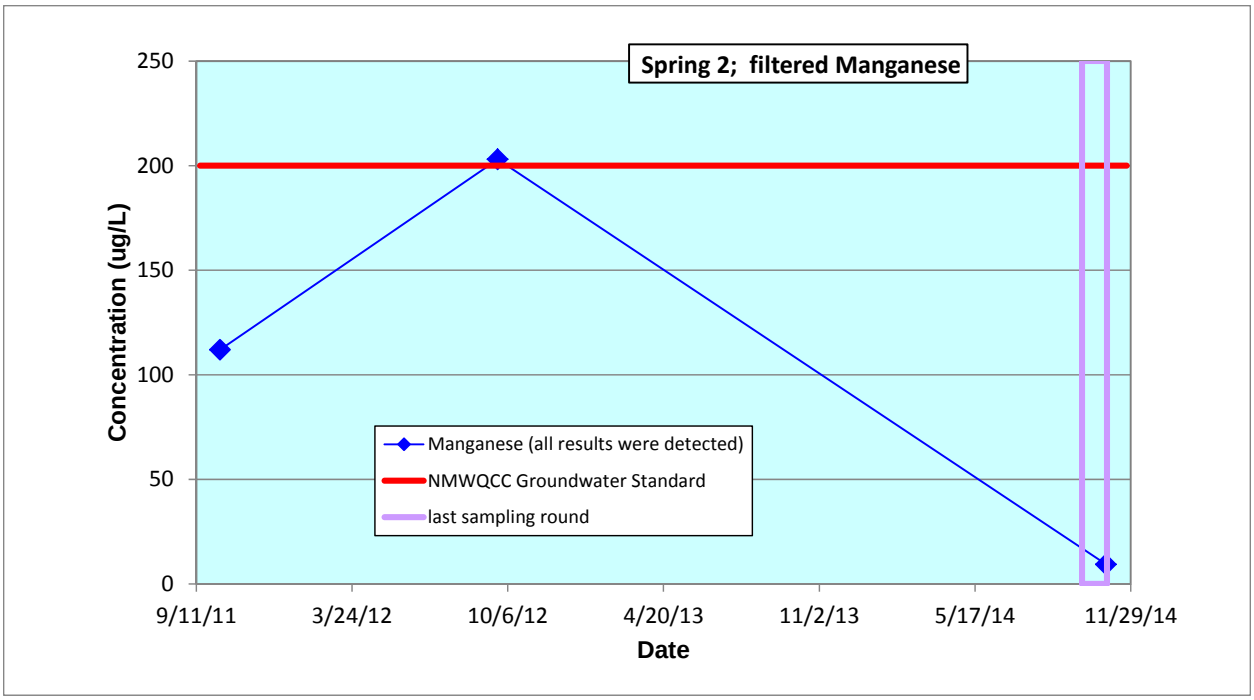
# Appendix E

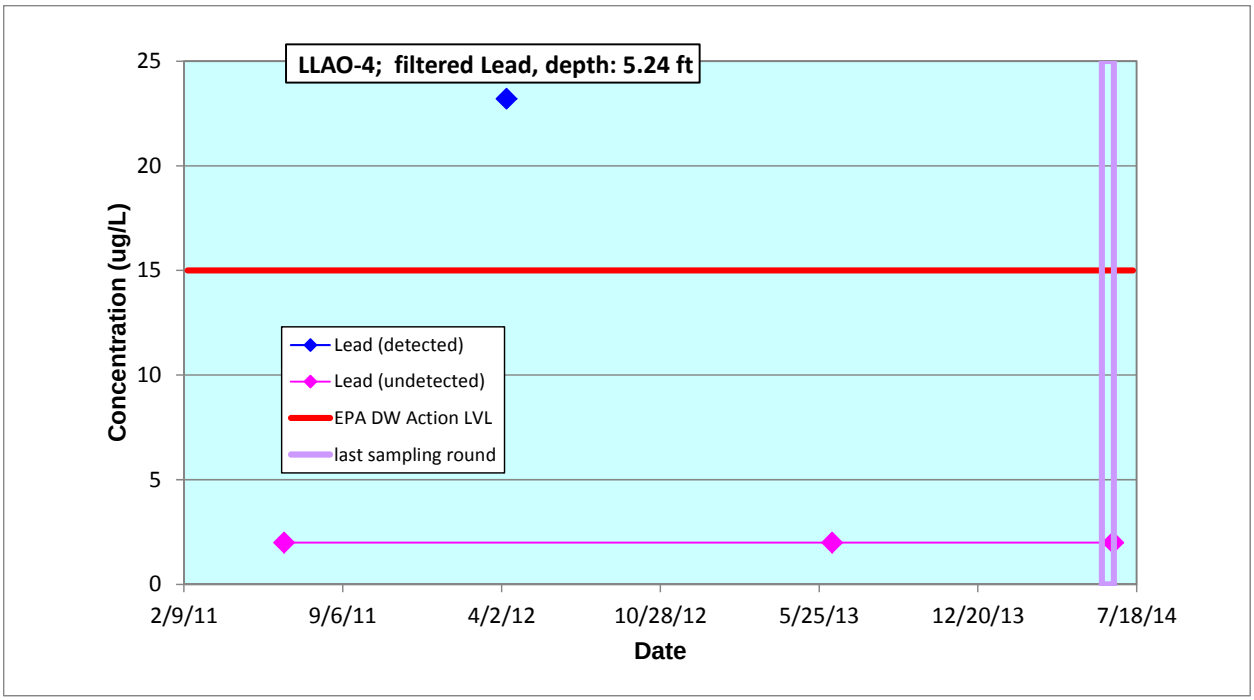
*Analytical Chemistry Graphs of Screening-Level Exceedances*

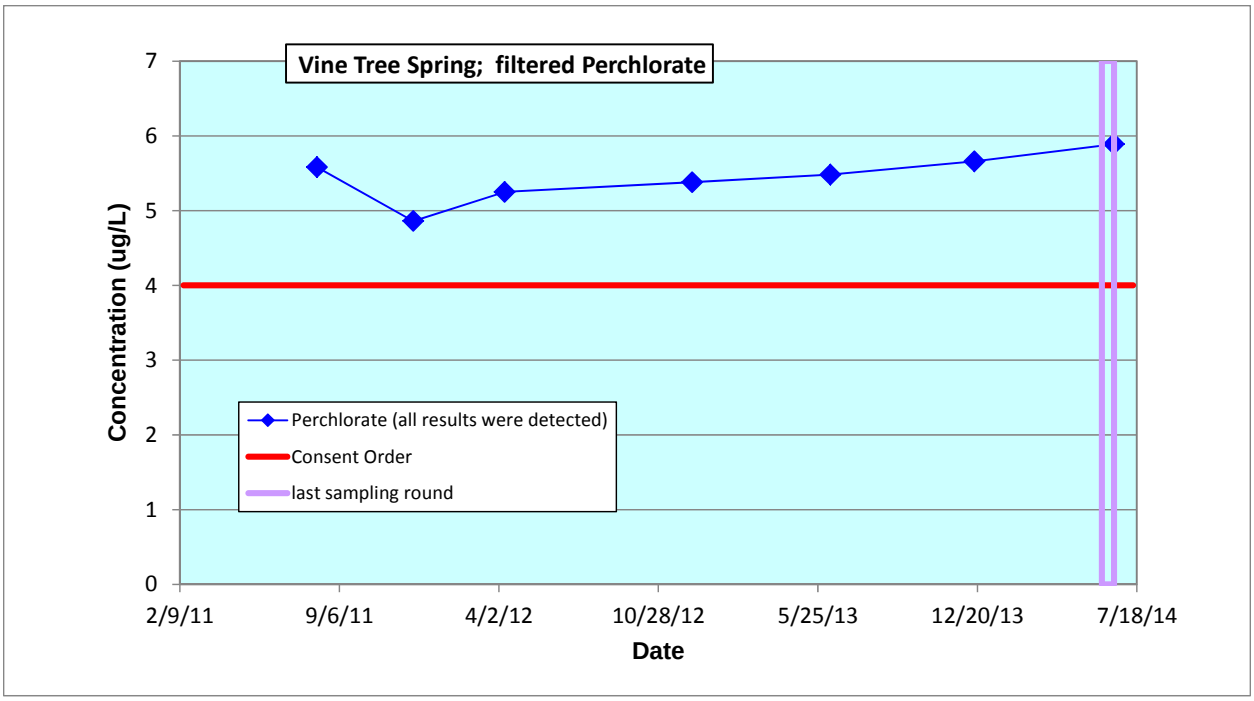

La Mesita Spring; unfiltered Gross alpha
Concentration (pCi/L)
18
16
14
12
10
8
6
4
2
0
9/11/11
3/24/12
10/6/12
4/20/13
11/2/13
5/17/14
11/29/14
Date
Gross alpha (all results were detected)
EPA MCL
last sampling round


Sacred Spring; filtered Manganese
Concentration (ug/L)
1200
1000
800
600
400
200
0
9/11/11
3/24/12
10/6/12
4/20/13
11/2/13
5/17/14
11/29/14
Date
Manganese (all results were detected)
NMWQCC Groundwater Standard
last sampling round


Spring 2; filtered Arsenic
Concentration (ug/L)
12
10
8
6
4
2
0
9/11/11
3/24/12
10/6/12
4/20/13
11/2/13
5/17/14
11/29/14
Date
Arsenic (all results were detected)
EPA MCL
last sampling round


Spring 2; filtered Manganese
Concentration (ug/L)
250
200
150
100
50
0
9/11/11
3/24/12
10/6/12
4/20/13
11/2/13
5/17/14
11/29/14
Date
Manganese (all results were detected)
NMWQCC Groundwater Standard
last sampling round


LLAO-4; filtered Lead, depth: 5.24 ft
Concentration (ug/L)
25
20
15
10
5
0
Lead (detected)
Lead (undetected)
EPA DW Action LVL
last sampling round
2/9/11
9/6/11
4/2/12
10/28/12
5/25/13
12/20/13
7/18/14
Date


Vine Tree Spring; filtered Perchlorate
Concentration (ug/L)
7
6
5
4
3
2
1
0
Perchlorate (all results were detected)
Consent Order
last sampling round
2/9/11
9/6/11
4/2/12
10/28/12
5/25/13
12/20/13
7/18/14
Date

# Appendix F

*Analytical Reports*
*(on CD included with this document)*

## CD Table of Contents

| Chain of Custody | Category | Lab | Sample | Date | Location | Screen Top Depth (ft) | Screen Bottom Depth (ft) |
|---|---|---|---|---|---|---|---|
| 2014-2698 | Inorganic | GELC[a] | CALA-14-46053 | 12/17/13 | Vine Tree Spring | —[b] | — |
| 2014-2698 | Inorganic | GELC | CALA-14-46054 | 12/17/13 | Vine Tree Spring | — | — |
| 2014-2698 | Organic | GELC | CALA-14-46053 | 12/17/13 | Vine Tree Spring | — | — |
| 2014-2723 | Inorganic | GELC | CAMO-14-45694 | 12/19/13 | R-34 | 883.7 | 906.6 |
| 2014-2723 | Inorganic | GELC | CAMO-14-45690 | 12/19/13 | R-34 | 883.7 | 906.6 |
| 2014-2789 | Inorganic | GELC | CAMO-14-53218 | 01/17/14 | R-34 | 883.7 | 906.6 |
| 2014-2789 | Inorganic | GELC | CAMO-14-53219 | 01/17/14 | R-34 | 883.7 | 906.6 |
| 2014-3375 | Inorganic | GELC | CAMO-14-75544 | 05/09/14 | R-34 | 883.7 | 906.6 |
| 2014-3375 | Inorganic | GELC | CAMO-14-75548 | 05/09/14 | R-34 | 883.7 | 906.6 |
| 2014-3574 | Inorganic | GELC | CALA-14-79458 | 06/17/14 | LLAO-4 | 5.24 | 15.24 |
| 2014-3574 | Inorganic | GELC | CALA-14-79447 | 06/17/14 | LLAO-4 | 5.24 | 15.24 |
| 2014-3574 | Inorganic | GELC | CALA-14-79448 | 06/17/14 | LLAO-4 | 5.24 | 15.24 |
| 2014-3574 | Inorganic | GELC | CALA-14-79464 | 06/17/14 | LLAO-4 | 5.24 | 15.24 |
| 2014-3574 | Organic | GELC | CALA-14-79458 | 06/17/14 | LLAO-4 | 5.24 | 15.24 |
| 2014-3574 | Organic | GELC | CALA-14-79447 | 06/17/14 | LLAO-4 | 5.24 | 15.24 |
| 2014-3574 | Rad[c] | GELC | CALA-14-79458 | 06/17/14 | LLAO-4 | 5.24 | 15.24 |
| 2014-3574 | Rad | GELC | CALA-14-79447 | 06/17/14 | LLAO-4 | 5.24 | 15.24 |
| 2014-3584 | Inorganic | GELC | CALA-14-79460 | 06/18/14 | Vine Tree Spring | — | — |
| 2014-3584 | Inorganic | GELC | CALA-14-79466 | 06/18/14 | Vine Tree Spring | — | — |
| 2014-3584 | Organic | GELC | CALA-14-79460 | 06/18/14 | Vine Tree Spring | — | — |
| 2014-3584 | Rad | GELC | CALA-14-79460 | 06/18/14 | Vine Tree Spring | — | — |
| 2014-3585 | Rad | ARSL[d] | CALA-14-79460 | 06/18/14 | Vine Tree Spring | — | — |
| 2014-4642 | Inorganic | GELC | CAWR-14-86942 | 09/29/14 | Spring 1 | — | — |
| 2014-4642 | Inorganic | GELC | CAWR-14-86969 | 09/29/14 | Spring 1 | — | — |
| 2014-4642 | Organic | GELC | CAWR-14-86942 | 09/29/14 | Spring 1 | — | — |
| 2014-4642 | Organic | GELC | CAWR-14-86943 | 09/29/14 | Spring 2 | — | — |
| 2014-4642 | Organic | GELC | CAWR-14-86892 | 09/29/14 | Spring 1 | — | — |
| 2014-4642 | Organic | GELC | CAWR-14-87098 | 09/29/14 | Spring 2 | — | — |
| 2014-4642 | Rad | GELC | CAWR-14-86942 | 09/29/14 | Spring 1 | — | — |
| 2014-4644 | Organic | SHEALY[e] | CAWR-14-86942 | 09/29/14 | Spring 1 | — | — |
| 2014-4644 | Organic | SHEALY | CAWR-14-86943 | 09/29/14 | Spring 2 | — | — |
| 2014-4644 | Organic | SHEALY | CAWR-14-86892 | 09/29/14 | Spring 1 | — | — |
| 2014-4644 | Organic | SHEALY | CAWR-14-87098 | 09/29/14 | Spring 2 | — | — |
| 2015-187 | Inorganic | GELC | CAWR-14-89231 | 10/29/14 | Spring 2 | — | — |
| 2015-187 | Inorganic | GELC | CAWR-14-89235 | 10/29/14 | Spring 2 | — | — |
| 2015-187 | Organic | GELC | CAWR-14-89231 | 10/29/14 | Spring 2 | — | — |
| 2015-187 | Organic | GELC | CAWR-14-89228 | 10/29/14 | La Mesita Spring | — | — |

| Chain of Custody | Category | Lab | Sample | Date | Location | Screen Top Depth (ft) | Screen Bottom Depth (ft) |
|---|---|---|---|---|---|---|---|
| 2015-187 | Rad | GELC | CAWR-14-89231 | 10/29/14 | Spring 2 | — | — |
| 2015-197 | Rad | ARSL | CAWR-14-89231 | 10/29/14 | Spring 2 | — | — |
| 2015-200 | Organic | SHEALY | CAWR-14-89229 | 10/30/14 | Sacred Spring | — | — |
| 2015-200 | Organic | SHEALY | CAWR-14-89222 | 10/30/14 | Sacred Spring | — | — |
| 2015-207 | Inorganic | GELC | CAWR-14-89229 | 10/30/14 | Sacred Spring | — | — |
| 2015-207 | Inorganic | GELC | CAWR-14-89236 | 10/30/14 | Sacred Spring | — | — |
| 2015-207 | Inorganic | GELC | CAWR-14-89222 | 10/30/14 | Sacred Spring | — | — |
| 2015-207 | Inorganic | GELC | CAWR-14-89223 | 10/30/14 | Sacred Spring | — | — |
| 2015-207 | Organic | GELC | CAWR-14-89229 | 10/30/14 | Sacred Spring | — | — |
| 2015-207 | Organic | GELC | CAWR-14-89222 | 10/30/14 | Sacred Spring | — | — |
| 2015-207 | Rad | GELC | CAWR-14-89229 | 10/30/14 | Sacred Spring | — | — |
| 2015-207 | Rad | GELC | CAWR-14-89222 | 10/30/14 | Sacred Spring | — | — |
| 2015-230 | Rad | ARSL | CAWR-14-89229 | 10/30/14 | Sacred Spring | — | — |
| 2015-230 | Rad | ARSL | CAWR-14-89222 | 10/30/14 | Sacred Spring | — | — |
| 2015-4 | Rad | ARSL | CAWR-14-86942 | 09/29/14 | Spring 1 | — | — |
| 2015-40 | Inorganic | GELC | CAWR-14-86939 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-40 | Inorganic | GELC | CAWR-14-86962 | 10/06/14 | La Mesita Spring | — | — |
| 2015-40 | Inorganic | GELC | CAWR-14-86880 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-40 | Inorganic | GELC | CAWR-14-86966 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-40 | Inorganic | GELC | CAWR-14-86884 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-40 | Inorganic | GELC | CAWR-14-86935 | 10/06/14 | La Mesita Spring | — | — |
| 2015-40 | Organic | GELC | CAWR-14-86880 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-40 | Organic | GELC | CAWR-14-86939 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-40 | Organic | GELC | CAWR-14-86935 | 10/06/14 | La Mesita Spring | — | — |
| 2015-40 | Rad | GELC | CAWR-14-86939 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-40 | Rad | GELC | CAWR-14-86880 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-40 | Rad | GELC | CAWR-14-86935 | 10/06/14 | La Mesita Spring | — | — |
| 2015-43 | Organic | CFA[f] | CAWR-14-86880 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-43 | Organic | CFA | CAWR-14-86939 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-44 | Organic | SHEALY | CAWR-14-86880 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-44 | Organic | SHEALY | CAWR-14-86939 | 10/06/14 | Rio Grande at Otowi Bridge | — | — |
| 2015-44 | Organic | SHEALY | CAWR-14-86935 | 10/06/14 | La Mesita Spring | — | — |
| 2015-49 | Rad | ARSL | CAWR-14-86935 | 10/06/14 | La Mesita Spring | — | — |

[a] GELC = General Engineering Laboratories, Inc., Charleston, SC.

[b] — = Not applicable.

[c] Rad = Radiochemistry (not gamma).

[d] ARSL = American Radiation Services, Inc.

[e] SHEALY = Shealy Environmental Services, Inc.

[f] CFA = Cape Fear Analytical, LLC.

**San Ildefonso General Surveillance Monitoring Group Data Validation Summary**

| Location | Category | Method | Qual | Qual Reason Code | Explanation | COC | Sample | Analyte |
|---|---|---|---|---|---|---|---|---|
| La Mesita Spring | INORGANIC | EPA:160.1 | J | I10a | The sample and the duplicate sample results were >=5X the RL and the duplicate RPD was >20% for water samples and >35% for soil samples. | 2015-40 | CAWR-14-86962 | Total Dissolved Solids |
| | | EPA:300.0 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-40 | CAWR-14-86962 | Bromide |
| | | EPA:351.2 | J+ | I6b | The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. | 2015-40 | CAWR-14-86935 | Total Kjeldahl Nitrogen |
| | | EPA:365.4 | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2015-40 | CAWR-14-86962 | Total Phosphate as Phosphorus |
| | | SW-846:6010C | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-40 | CAWR-14-86962 | Vanadium |
| | | SW-846:6020 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-40 | CAWR-14-86962 | Chromium |
| | | SW-846:9060 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-40 | CAWR-14-86935 | Total Organic Carbon |
| | ORGANIC | SW-846:8270D | UJ | SV12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2015-44 | CAWR-14-86935 | Atrazine<br>Benzidine<br>Dichlorobenzidine[3,3'-] |
| | RAD | EPA:901.1 | R | R5a | The MDC and/or TPU documentation is missing. Data may not be acceptable for use. | 2015-40 | CAWR-14-86935 | Potassium-40 |
| | | | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-40 | CAWR-14-86935 | Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Sodium-22 |
| | | EPA:905.0 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-40 | CAWR-14-86935 | Strontium-90 |
| | | Generic:Low_Level_Tritium | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-49 | CAWR-14-86935 | Tritium |
| | | HASL-300:AM-241 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-40 | CAWR-14-86935 | Americium-241 |
| | | HASL-300:ISOPU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-40 | CAWR-14-86935 | Plutonium-238<br>Plutonium-239/240 |
| LLAO-4 | INORGANIC | EPA:351.2 | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2014-3574 | CALA-14-79447 | Total Kjeldahl Nitrogen |
| | | EPA:353.2 | J | I4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x | 2014-3574 | CALA-14-79464 | Nitrate-Nitrite as Nitrogen |
| | | | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2014-3574 | CALA-14-79448 | Nitrate-Nitrite as Nitrogen |
| | | EPA:365.4 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-3574 | CALA-14-79448<br>CALA-14-79464 | Total Phosphate as Phosphorus<br>Total Phosphate as Phosphorus |
| | | SW-846:6020 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-3574 | CALA-14-79448<br>CALA-14-79464 | Nickel<br>Nickel |
| | ORGANIC | SW-846:8260B | UJ | V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2014-3574 | CALA-14-79447<br>CALA-14-79458 | Chloro-1-propene[3-]<br>Methylene Chloride<br>Chloro-1-propene[3-] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Methylene Chloride |
| | | SW-846:8270D | UJ | SV12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2014-3574 | CALA-14-79447<br><br><br><br>CALA-14-79458 | <br>Nitrophenol[4-]<br>Tetrachlorobenzene[1,2,4,5]<br>Nitrophenol[4-]<br>Tetrachlorobenzene[1,2,4,5] |
| | | SW-846:8321A_MOD | UJ | HE12a | The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits. | 2014-3574 | CALA-14-79447<br><br><br>CALA-14-79458 | <br><br>Tetryl<br>Tetryl |
| | RAD | EPA:900 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3574 | CALA-14-79447<br><br>CALA-14-79458 | <br>Gross alpha<br>Gross alpha<br>Gross beta |
| | | EPA:901.1 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3574 | CALA-14-79447<br><br><br><br><br><br>CALA-14-79458 | <br>Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22<br>Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22 |
| | | EPA:905.0 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3574 | CALA-14-79447<br><br>CALA-14-79458 | <br>Strontium-90<br>Strontium-90 |
| | | HASL-300:AM-241 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3574 | CALA-14-79447<br><br>CALA-14-79458 | <br>Americium-241<br>Americium-241 |
| | | HASL-300:ISOPU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3574 | CALA-14-79447<br><br><br>CALA-14-79458 | <br>Plutonium-238<br>Plutonium-239/240<br>Plutonium-238<br>Plutonium-239/240 |
| | | HASL-300:ISOU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3574 | CALA-14-79447<br><br>CALA-14-79458 | <br>Uranium-235/236<br>Uranium-235/236 |
| R-34 | INORGANIC | EPA:335.4 | J- | I6a | The associated matrix spike recovery was below the lower acceptance limit (LAL) but >10%. Follow the external laboratory limits located within the associated data package. | 2014-2723 | CAMO-14-45690 | <br><br><br>Cyanide (Total) |
| | | EPA:350.1 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-2789<br><br><br>2014-3375 | CAMO-14-53219<br><br><br>CAMO-14-75548 | <br><br>Ammonia as Nitrogen<br>Ammonia as Nitrogen |
| | | | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2014-2723 | CAMO-14-45694 | <br>Ammonia as Nitrogen |
| | | EPA:365.4 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-2723<br><br><br>2014-2789 | CAMO-14-45694<br><br><br>CAMO-14-53219 | <br><br>Total Phosphate as Phosphorus<br>Total Phosphate as Phosphorus |
| | | SW-846:6010B | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-2723<br><br><br><br>2014-2789 | CAMO-14-45694<br><br><br><br>CAMO-14-53219 | <br><br>Boron<br>Zinc<br>Boron<br>Zinc |

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|---|---|---|---|---|---|---|---|---|
| | | SW-846:6010C | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-3375 | CAMO-14-75548 | Boron |
| | | SW-846:6020 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-2723 | CAMO-14-45694 | Chromium<br>Selenium |
| | | | | | | 2014-2789 | CAMO-14-53219 | Chromium<br>Nickel |
| | | | | | | 2014-3375 | CAMO-14-75548 | Chromium |
| | | | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2014-2723 | CAMO-14-45694 | Arsenic<br>Molybdenum |
| | | SW-846:9060 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-3375 | CAMO-14-75544 | Total Organic Carbon |
| Rio Grande at Otowi Bridge | INORGANIC | EPA:365.4 | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2015-40 | CAWR-14-86884 | Total Phosphate as Phosphorus |
| | | | | | | | CAWR-14-86966 | Total Phosphate as Phosphorus |
| | | SW-846:6010C | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-40 | CAWR-14-86884 | Boron<br>Manganese<br>Vanadium |
| | | | | | | | CAWR-14-86966 | Boron<br>Manganese<br>Vanadium |
| | | SW-846:6020 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-40 | CAWR-14-86884 | Nickel |
| | | | | | | | CAWR-14-86966 | Nickel |
| | | | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2015-40 | CAWR-14-86884 | Arsenic |
| | | | | | | | CAWR-14-86966 | Arsenic |
| | | SW-846:6850 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-40 | CAWR-14-86884 | Perchlorate |
| | | | | | | | CAWR-14-86966 | Perchlorate |
| | ORGANIC | SW-846:8270D | UJ | SV3a | The surrogate is < the Lower Acceptance Level (LAL) but >=10%R. Follow the external laboratory limits located within the associated data package. | 2015-40 | CAWR-14-86939 | Aniline<br>Atrazine<br>Azobenzene<br>Benzidine<br>Benzoic Acid<br>Benzyl Alcohol<br>Bis(2-chloroethoxy)methane<br>Bis(2-chloroethyl)ether<br>Bis(2-ethylhexyl)phthalate<br>Bromophenyl-phenylether[4-]<br>Butylbenzylphthalate<br>Chloro-3-methylphenol[4-]<br>Chloroaniline[4-]<br>Chloronaphthalene[2-]<br>Chlorophenol[2-]<br>Chlorophenyl-phenyl[4-] Ether<br>Dibenzofuran<br>Dichlorobenzene[1,2-]<br>Dichlorobenzene[1,3-]<br>Dichlorobenzene[1,4-] |

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|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Dichlorobenzidine[3,3'-]<br>Dichlorophenol[2,4-]<br>Diethylphthalate<br>Dimethyl Phthalate<br>Dimethylphenol[2,4-]<br>Di-n-butylphthalate<br>Dinitro-2-methylphenol[4,6-]<br>Dinitrophenol[2,4-]<br>Dinitrotoluene[2,4-]<br>Dinitrotoluene[2,6-]<br>Di-n-octylphthalate<br>Dinoseb<br>Dioxane[1,4-]<br>Diphenylamine<br>Hexachlorobenzene<br>Hexachlorobutadiene<br>Hexachlorocyclopentadiene<br>Hexachloroethane<br>Isophorone<br>Methylphenol[2-]<br>Methylphenol[4-]<br>Nitroaniline[2-]<br>Nitroaniline[3-]<br>Nitroaniline[4-]<br>Nitrobenzene<br>Nitrophenol[2-]<br>Nitrophenol[4-]<br>Nitrosodiethylamine[N-]<br>Nitrosodimethylamine[N-]<br>Nitroso-di-n-butylamine[N-]<br>Nitroso-di-n-propylamine[N-]<br>Nitrosopyrrolidine[N-]<br>Oxybis(1-chloropropane)[2,2'-]<br>Pentachlorobenzene<br>Phenol<br>Pyridine<br>Tetrachlorobenzene[1,2,4,5]<br>Tetrachlorophenol[2,3,4,6-]<br>Trichlorobenzene[1,2,4-]<br>Trichlorophenol[2,4,5-]<br>Trichlorophenol[2,4,6-] |
| | | | UJ | SV12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2015-44 | CAWR-14-86880<br><br><br><br><br>CAWR-14-86939 | <br>Atrazine<br>Benzidine<br>Dichlorobenzidine[3,3'-]<br>Atrazine<br>Benzidine<br>Dichlorobenzidine[3,3'-] |
| | RAD | EPA:901.1 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-40 | CAWR-14-86880<br><br><br><br><br>CAWR-14-86939 | <br>Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22<br>Cesium-137 |

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|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22 |
| | | EPA:905.0 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-40 | CAWR-14-86880<br>CAWR-14-86939 | Strontium-90<br>Strontium-90 |
| | | HASL-300:AM-241 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-40 | CAWR-14-86880<br>CAWR-14-86939 | Americium-241<br>Americium-241 |
| | | HASL-300:ISOPU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-40 | CAWR-14-86880<br>CAWR-14-86939 | Plutonium-238<br>Plutonium-239/240<br>Plutonium-238<br>Plutonium-239/240 |
| Sacred Spring | INORGANIC | EPA:300.0 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-207 | CAWR-14-89223<br>CAWR-14-89236 | Bromide<br>Bromide |
| | | EPA:350.1 | J | I4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x | 2015-207 | CAWR-14-89223<br>CAWR-14-89236 | Ammonia as Nitrogen<br>Ammonia as Nitrogen |
| | | SW-846:6010C | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-207 | CAWR-14-89223<br>CAWR-14-89236 | Boron<br>Vanadium<br>Zinc<br>Boron<br>Vanadium |
| | | SW-846:6020 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-207 | CAWR-14-89223<br>CAWR-14-89236 | Arsenic<br>Arsenic |
| | | SW-846:9060 | J- | I9 | The holding time was >1 and <=2 times the applicable holding time requirement. | 2015-207 | CAWR-14-89222<br>CAWR-14-89229 | Total Organic Carbon<br>Total Organic Carbon |
| | ORGANIC | SW-846:8260B | UJ | V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2015-207 | CAWR-14-89222<br>CAWR-14-89229 | Propylbenzene[1-]<br>Propylbenzene[1-] |
| | RAD | EPA:900 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-207 | CAWR-14-89222<br>CAWR-14-89229 | Gross alpha<br>Gross alpha<br>Gross beta |
| | | EPA:901.1 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-207 | CAWR-14-89222<br>CAWR-14-89229 | Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22<br>Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22 |
| | | EPA:905.0 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-207 | CAWR-14-89222<br>CAWR-14-89229 | Strontium-90<br>Strontium-90 |
| | | Generic:Low_Level_Tritium | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-230 | CAWR-14-89222 | Tritium |

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|---|---|---|---|---|---|---|---|---|
| | | | | | | | CAWR-14-89229 | Tritium |
| | | HASL-300:AM-241 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-207 | CAWR-14-89222<br>CAWR-14-89229 | Americium-241<br>Americium-241 |
| | | HASL-300:ISOPU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-207 | CAWR-14-89222<br>CAWR-14-89229 | Plutonium-238<br>Plutonium-239/240<br>Plutonium-238<br>Plutonium-239/240 |
| | | HASL-300:ISOU | J | R4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5X. | 2015-207 | CAWR-14-89222 | Uranium-234 |
| | | | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-207 | CAWR-14-89222 | Uranium-235/236 |
| | | | U | R4 | The sample result is <=5X the concentration of the related analyte in the method blank. | 2015-207 | CAWR-14-89229 | Uranium-234 |
| | | | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-207 | CAWR-14-89229 | Uranium-235/236 |
| Spring 1 | INORGANIC | EPA:350.1 | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2014-4642 | CAWR-14-86969 | Ammonia as Nitrogen |
| | | SW-846:6010C | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-4642 | CAWR-14-86969 | Boron |
| | | SW-846:6020 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-4642 | CAWR-14-86969 | Chromium |
| | | SW-846:9060 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-4642 | CAWR-14-86942 | Total Organic Carbon |
| | ORGANIC | SW-846:8321A_MOD | UJ | HE12a | The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits. | 2014-4642 | CAWR-14-86892 | Tetryl |
| | RAD | EPA:900 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-4642 | CAWR-14-86942 | Gross alpha<br>Gross beta |
| | | EPA:901.1 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-4642 | CAWR-14-86942 | Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22 |
| | | EPA:905.0 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-4642 | CAWR-14-86942 | Strontium-90 |
| | | Generic:Low_Level_Tritium | U | R11 | The results for the affected analytes should be regarded as not-detected (U) because the associated sample concentration was less than 3x the 1 sigma TPU. | 2015-4 | CAWR-14-86942 | Tritium |
| | | HASL-300:AM-241 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-4642 | CAWR-14-86942 | Americium-241 |
| | | HASL-300:ISOPU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-4642 | CAWR-14-86942 | Plutonium-238<br>Plutonium-239/240 |
| | | HASL-300:ISOU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-4642 | CAWR-14-86942 | Uranium-235/236 |
| Spring 2 | INORGANIC | EPA:160.1 | J | I10a | The sample and the duplicate sample results were >=5X the RL and the duplicate RPD was >20% for water samples and >35% for soil samples. | 2015-187 | CAWR-14-89235 | Total Dissolved Solids |
| | | EPA:350.1 | J | I10a | The sample and the duplicate sample results were >=5X the RL and the duplicate RPD was >20% for water samples and >35% for soil samples. | 2015-187 | CAWR-14-89235 | Ammonia as Nitrogen |
| | | SW-846:6010C | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-187 | CAWR-14-89235 | Boron<br>Iron |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Manganese<br>Zinc |
| | | SW-846:6020 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-187 | CAWR-14-89235 | Arsenic<br>Chromium |
| | | | J | I4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x | 2015-187 | CAWR-14-89235 | Uranium |
| | | SW-846:6850 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2015-187 | CAWR-14-89235 | Perchlorate |
| | | SW-846:9060 | J- | I9 | The holding time was >1 and <=2 times the applicable holding time requirement. | 2015-187 | CAWR-14-89231 | Total Organic Carbon |
| | ORGANIC | SW-846:8260B | UJ | V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2015-187 | CAWR-14-89231 | Propylbenzene[1-] |
| | | SW-846:8310 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-4642 | CAWR-14-86943 | Benzo(k)fluoranthene |
| | | SW-846:8321A_MOD | UJ | HE9 | The holding time was >1 and <=2 times the applicable holding time requirement. | 2015-187 | CAWR-14-89231 | 2,4-Diamino-6-nitrotoluene<br>2,6-Diamino-4-nitrotoluene<br>3,5-Dinitroaniline<br>Amino-2,6-dinitrotoluene[4-]<br>Amino-4,6-dinitrotoluene[2-]<br>Dinitrobenzene[1,3-]<br>Dinitrotoluene[2,4-]<br>Dinitrotoluene[2,6-]<br>HMX<br>Nitrobenzene<br>Nitrotoluene[2-]<br>Nitrotoluene[3-]<br>Nitrotoluene[4-]<br>PETN<br>RDX<br>TATB<br>Tetryl<br>Trinitrobenzene[1,3,5-]<br>Trinitrotoluene[2,4,6-]<br>Tris (o-cresyl) phosphate |
| | RAD | EPA:901.1 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-187 | CAWR-14-89231 | Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22 |
| | | EPA:905.0 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-187 | CAWR-14-89231 | Strontium-90 |
| | | Generic:Low_Level_Tritium | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-197 | CAWR-14-89231 | Tritium |
| | | HASL-300:AM-241 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-187 | CAWR-14-89231 | Americium-241 |
| | | HASL-300:ISOPU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2015-187 | CAWR-14-89231 | Plutonium-238<br>Plutonium-239/240 |
| Vine Tree Spring | INORGANIC | EPA:300.0 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-2698<br>2014-3584 | CALA-14-46054<br>CALA-14-79466 | Bromide<br>Bromide |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | EPA:335.4 | UJ | I6a | The associated matrix spike recovery was below the lower acceptance limit (LAL) but >10%. Follow the external laboratory limits located within the associated data package. | 2014-2698 | CALA-14-46053 | Cyanide (Total) |
| | | EPA:351.2 | U | I4 | the sample result is =<5x the concentration of related analyte in the method blank. | 2014-3584 | CALA-14-79460 | Total Kjeldahl Nitrogen |
| | | EPA:353.2 | J | I4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x | 2014-3584 | CALA-14-79466 | Nitrate-Nitrite as Nitrogen |
| | | SW-846:6010B | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-2698 | CALA-14-46054 | Boron |
| | | | J+ | I6b | The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. | 2014-2698 | CALA-14-46054 | Sodium |
| | | SW-846:6010C | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-3584 | CALA-14-79466 | Boron |
| | | SW-846:6020 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-2698<br><br><br><br>2014-3584 | CALA-14-46054<br><br><br><br>CALA-14-79466 | Nickel<br>Selenium<br>Arsenic<br>Nickel |
| | | SW-846:9060 | J | J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL | 2014-3584 | CALA-14-79460 | Total Organic Carbon |
| | ORGANIC | SW-846:8260B | UJ | V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2014-3584 | CALA-14-79460 | Chloro-1-propene[3-]<br>Methylene Chloride |
| | | SW-846:8270D | UJ | SV12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2014-3584 | CALA-14-79460 | Nitrophenol[4-]<br>Tetrachlorobenzene[1,2,4,5] |
| | | SW-846:8321A_MOD | UJ | HE12a | The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits. | 2014-3584 | CALA-14-79460 | Tetryl |
| | RAD | EPA:900 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3584 | CALA-14-79460 | Gross alpha |
| | | EPA:901.1 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3584 | CALA-14-79460 | Cesium-137<br>Cobalt-60<br>Neptunium-237<br>Potassium-40<br>Sodium-22 |
| | | EPA:905.0 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3584 | CALA-14-79460 | Strontium-90 |
| | | Generic:Low_Level_Tritium | J- | R12a | The LCS percent recovery was <the LAL but >10%. Follow the external laboratory limits located within the associated data package. | 2014-3585 | CALA-14-79460 | Tritium |
| | | HASL-300:AM-241 | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3584 | CALA-14-79460 | Americium-241 |
| | | HASL-300:ISOPU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3584 | CALA-14-79460 | Plutonium-238<br>Plutonium-239/240 |
| | | HASL-300:ISOU | U | R5 | Analyte is not detected because the amount reported is less than the MDC. | 2014-3584 | CALA-14-79460 | Uranium-235/236 |

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

COC/Lab Request #: 2014-2698



**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:**

**Lab Reporting Limit Type:**

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8260B-VOA | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-46053 | Dec 17 2013 | 09:45 | W | 1 | 2 | | 1 | | | 1 |
| CALA-14-46054 | Dec 17 2013 | 09:45 | W | | | 1 | | 1 | 1 | |
| CALA-14-46055 | Dec 17 2013 | 09:45 | W | | 2 | | | | | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 12/18/13 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4470

**EVENT NAME:** LA/Pueblo (General Surveillance) Q1 MY2014 Sampling Event

**SAMPLE ID:** CALA-14-46053

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 12/17/2013 | FIELD MATRIX: | WG | dl |
| TIME COLLECTED (HH:MM): | | 0945 | MEDIA: | UA | |
| PRS ID: | | QC | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Vine Tree Spring | | FIELD PREP: | UF | dl |
| LOCATION TYPE: | SPR | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:** NA

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen 7.97 mg/L  Oxidation-Reduction Potential NA mV  pH 7.04 SU  Q = 3.14 gpm

Specific Conductance 296 uS/cm  Temperature 11.83 deg C  Turbidity 2.2 NTU

**COLLECTED BY (PRINT)** J. Romero

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| William Skeen | 12/17/13 1:34 | K. Greene | 12/17/13 1:34 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 11/19/2013

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4470

**EVENT NAME:** LA/Pueblo (General Surveillance) Q1 MY2014 Sampling Event

**SAMPLE ID:** CALA-14-46054

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 12/17/2013 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 0945 | MEDIA: | UA | — |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Vine Tree Spring | — | FIELD PREP: | F | OK |
| LOCATION TYPE: | SPR | — | FIELD QC TYPE: | REG | — |
| PORT: | | — | SAMPLE USAGE: | INV | — |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | N/A |
| — | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | — | — |
| — | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | — | — |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

William Shear 12/17/2013

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Oxidation-Reduction Potential _____ mV pH _____ SU

Specific Conductance _____ uS/cm Temperature _____ deg C Turbidity _____ NTU

**COLLECTED BY (PRINT)** J. Romero

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** William Shear | **Date/Time** 12/17/13 1134 | **RECEIVED BY (Printed Name) (Signature)** K. Green | **Date/Time** 12/17/13 1134 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 11/19/2013

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4470

**EVENT NAME:** LA/Pueblo (General Surveillance) Q1 MY2014 Sampling Event

**SAMPLE ID:** CALA-14-46055

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 12/17/2013 | FIELD MATRIX: | WG | gk |
| TIME COLLECTED (HH:MM): | | 0945 | MEDIA: | UA | |
| PRS ID: | | gk | SAMPLE TECH CODE: | UA | [illegible] PP PC |
| LOCATION ID: | Vine Tree Spring | | FIELD PREP: | UF | GK |
| LOCATION TYPE: | | | FIELD QC TYPE: | FTB | |
| PORT: | | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | X | N/A |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:** W. Thomas Shaw 12/17/2013

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Oxidation-Reduction Potential _____ mV pH _____ SU

Specific Conductance _____ uS/cm Temperature _____ deg C Turbidity _____ NTU

**COLLECTED BY (PRINT)** V. Shaw

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| W. Thomas Shaw | 12/17/13 1134 | K. Green | 12/17/13 1134 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 11/19/2013

for:

Data Validation Report

Chain Of Custody No. 2014-2698

**1. Distribution Of Samples In EDD.**

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 339627 | EPA:120.1 | 1 | | | | |
| 339627 | EPA:150.1 | 1 | | | | |
| 339627 | EPA:160.1 | 1 | | | | |
| 339627 | EPA:245.2 | 2 | | | | |
| 339627 | EPA:300.0 | 1 | | | | |
| 339627 | EPA:310.1 | 1 | | | | |
| 339627 | EPA:335.4 | 1 | | | | |
| 339627 | EPA:351.2 | 1 | | | | |
| 339627 | SM:A2340B | 1 | | | | |
| 339627 | SW-846:6010B | 1 | | | | |
| 339627 | SW-846:6020 | 1 | | | | |
| 339627 | SW-846:6850 | 1 | | | | |
| 339627 | SW-846:8260B | 1 | | | | |
| 339627 | SW-846:9060 | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 339627 | EPA:120.1 | 1357259 | 1357259 | 1 | | | | | | | |
| 339627 | EPA:150.1 | 1356320 | 1356320 | 1 | | | | | | | |
| 339627 | EPA:160.1 | 1355285 | 1355285 | 1 | | | | | 1 | | |
| 339627 | EPA:245.2 | 1357406 | 1357405 | 2 | | | | | 1 | 2 | |
| 339627 | EPA:300.0 | 1355133 | 1355133 | 1 | | | | | 1 | | |
| 339627 | EPA:310.1 | 1356417 | 1356417 | 1 | | | | | 1 | 1 | |
| 339627 | EPA:335.4 | 1355464 | 1355463 | 1 | | | | | 1 | 2 | |
| 339627 | EPA:351.2 | 1354977 | 1354976 | 1 | | | | | 1 | 2 | |
| 339627 | SM:A2340B | 1360300 | 1360300 | 1 | | | | | | | |
| 339627 | SW-846:6010B | 1355210 | 1355209 | 1 | | | | | 1 | 2 | |
| 339627 | SW-846:6020 | 1355208 | 1355207 | 1 | | | | | 1 | 1 | |
| 339627 | SW-846:6850 | 1356870 | 1356869 | 1 | | | | | 1 | 1 | 1 |
| 339627 | SW-846:8260B | 1356833 | 1356833 | 1 | | | | | 1 | | |
| 339627 | SW-846:9060 | 1355360 | 1355360 | 1 | | | | | 1 | | |

**2. Distribution Of Analytes In EDD.**

| Analytical Method | Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spikes | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CALA-14-46054 | 339627002 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAPA-14-49424 | 1203013064 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203013063 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CALA-14-46054 | 339627002 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAPA-14-49316 | 1203010654 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAPA-14-49409 | 1203010653 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203010658 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CALA-14-46054 | 339627002 | REG | 1 | 0 | 0 | 0 |

for:

| Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spikes | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | | | 1 | | | |
| | | 1 | | | | 2 | | | |
| | | 1 | | | | 2 | | | |
| | | 1 | | | | 2 | | | |
| | | 1 | | | | 1 | | | |
| | | 1 | | | | 1 | | | |
| | | 1 | | | | 2 | | | |
| | | 1 | | | | 2 | | | |
| | | | | | | | | | |
| | | 1 | | | | 2 | | | |
| | | 1 | | | | 1 | | | |
| | | 1 | | | | | | | |
| | | 2 | | | | | | | |
| | | 1 | | | | 2 | | | |

for:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EPA:160.1 | GENERAL CHEMISTRY | CAPA-14-49425 | 1203008160 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-13-42159 | 1203008159 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203008162 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203008158 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-46053 | 339627001 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-46054 | 339627002 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAPA-14-49397 | 1203013372 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAPA-14-49397 | 1203013374 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | CAPA-14-49398 | 1203013369 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAPA-14-49398 | 1203013370 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203013368 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203013367 | MB | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CALA-14-46054 | 1203007870 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CALA-14-46054 | 339627002 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203007872 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203007869 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CALA-14-46054 | 339627002 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-14-49424 | 1203010875 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-14-49424 | 1203010876 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203010874 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203010873 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CALA-14-46053 | 1203008538 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CALA-14-46053 | 1203008540 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CALA-14-46053 | 339627001 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAPA-14-49376 | 1203008539 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAPA-14-49376 | 1203008541 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203008542 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203008537 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CALA-14-46053 | 339627001 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-14-49383 | 1203007487 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-14-49383 | 1203007488 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-14-49390 | 1203010120 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-14-49390 | 1203010121 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203007485 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203007484 | MB | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CALA-14-46054 | 339627002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CALA-14-46054 | 1203007988 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CALA-14-46054 | 1203007989 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC | CALA-14-46054 | 339627002 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CAPA-14-49424 | 1203007991 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CAPA-14-49424 | 1203007992 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC | LCS | 1203007987 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC | MB | 1203007986 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CALA-14-46054 | 339627002 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAPA-14-49424 | 1203007983 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAPA-14-49424 | 1203007984 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203007982 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203007981 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CALA-14-46054 | 339627002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-45694 | 1203012013 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-45694 | 1203012014 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203012012 | LCS | 0 | 0 | 1 | 0 |

for:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203012011 | MB | 1 | 0 | 0 | 0 |
| SW-846:8260B | VOC | CALA-14-46053 | 339627001 | REG | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | LCS | 1203011877 | LCS | 0 | 3 | 70 | 0 |
| SW-846:8260B | VOC | LCS | 1203011878 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203011874 | MB | 80 | 3 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CALA-14-46053 | 339627001 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAPA-14-49399 | 1203008308 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-13-42147 | 1203008307 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203008311 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203008306 | MB | 1 | 0 | 0 | 0 |

**3. Are any analytes missing?**

No.

**4. Were any holding times exceeded?**

No.

**5. Any contaminants in blanks?**

| Field Sample ID | Lab Sample ID | Type Of Blank | Analytical Method | Sample Matrix | Parameter Name | Lab Result | Lab Qualifier | Units | Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203007986 | METHOD BLANK | SW-846:6010B | W | Potassium | 53.2 | J | ug/L | 150 |
| MB | 1203007986 | METHOD BLANK | SW-846:6010B | W | Sodium | 182 | J | ug/L | 300 |
| MB | 1203010873 | METHOD BLANK | EPA:310.1 | W | Alkalinity-CO3+HCO3 | 2.12 | | mg/L | 1 |

**Any samples affected by the presence of contaminants in blanks?**

No.

**6. Any surrogate recoveries outside the control limits?**

No.

**7. Any MS/MSD recoveries or RPDs outside the control limits?**

| Field Sample ID | Matrix Spike ID | Matrix Spike Dup ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS % Recvry | MSD % Recvry | Upper Limit | Lower Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-46053 | 1203008540 | | EPA:335.4 | Cyanide (Total) | 1355463 | 12/23/2013 | W | 75.5 | | 110 | 90 |
| CALA-14-46053 | 1203008540 | | EPA:335.4 | Cyanide (Total) | 1355463 | 12/23/2013 | W | 75.5 | | 110 | 90 |
| CAPA-14-49383 | 1203007488 | | EPA:351.2 | Total Kjeldahl Nitrogen | 1354976 | 12/27/2013 | W | 88.7 | | 110 | 90 |
| CALA-14-46054 | 1203007989 | | SW-846:6010B | Sodium | 1355209 | 1/10/2014 | W | 128 | | 125 | 75 |
| CALA-14-46054 | 1203007989 | | SW-846:6010B | Sodium | 1355209 | 1/10/2014 | W | 128 | | 125 | 75 |
| CAPA-14-49424 | 1203007992 | | SW-846:6010B | Silicon Dioxide | 1355209 | 1/10/2014 | W | 147 | | 125 | 75 |

**8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?**

| LCS Sample ID | LCSD Sample ID | Analytical Method | Parameter Name | Lab Lot ID | Analysis Date | Sample Matrix | LCS Recovery | LCSD Recovery | Upper Limit | Lower Limit | Lower Reject Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203011877 | | SW-846:8260B | Trichlorobenzene[1,2,4-] | 1356833 | 12/29/2013 | W | 132 | | 130 | 66 | 10 |

**9. Any Field Duplicate RPDs outside the desired limits?**

for:

| Rejection Limit | RPD | RPD Limit |
|---|---|---|
| 10 | | |
| 10 | | |
| 10 | | |
| 10 | | |
| 10 | | |
| 10 | | |

| Upper Reject Limit | RPD | RPD Limit |
|---|---|---|
| | | |

for:

No.

**10. Any Lab Duplicate RPDs outside the desired limits?**

| Field Sample ID | Lab SampleID | Lab Duplicate Sample ID | Analytical Method | Parameter Name | Sample Matrix | Sample Result | Dup Sample Result | Units | Detected In Sample | Detected In Dup | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-46054 | 339627002 | 1203007870 | EPA:300.0 | Chloride | W | 17.5 | 17.4 | mg/L | Y | Y | 0.367 |
| CALA-14-46054 | 339627002 | 1203007870 | EPA:300.0 | Fluoride | W | 0.486 | 0.498 | mg/L | Y | Y | 2.58 |
| CALA-14-46054 | 339627002 | 1203007870 | EPA:300.0 | Sulfate | W | 21.7 | 21.7 | mg/L | Y | Y | 0.184 |
| CALA-14-46054 | 339627002 | 1203007988 | SW-846:6010B | Barium | W | 49.6 | 51.5 | ug/L | Y | Y | 3.86 |
| CALA-14-46054 | 339627002 | 1203007988 | SW-846:6010B | Calcium | W | 27900 | 29300 | ug/L | Y | Y | 4.84 |
| CALA-14-46054 | 339627002 | 1203007988 | SW-846:6010B | Magnesium | W | 7860 | 8200 | ug/L | Y | Y | 4.18 |
| CALA-14-46054 | 339627002 | 1203007988 | SW-846:6010B | Potassium | W | 5270 | 5490 | ug/L | Y | Y | 4.05 |
| CALA-14-46054 | 339627002 | 1203007988 | SW-846:6010B | Silicon Dioxide | W | 45300 | 47100 | ug/L | Y | Y | 3.88 |
| CALA-14-46054 | 339627002 | 1203007988 | SW-846:6010B | Sodium | W | 18100 | 19300 | ug/L | Y | Y | 6.48 |
| CALA-14-46054 | 339627002 | 1203007988 | SW-846:6010B | Strontium | W | 139 | 145 | ug/L | Y | Y | 4.46 |
| CALA-14-46054 | 339627002 | 1203007988 | SW-846:6010B | Vanadium | W | 8.06 | 8.17 | ug/L | Y | Y | 1.36 |

**11. Any required reporting limits exceeded?**

No.

**12. Additional Validator's Coments.**

None.

**13. Display Flagged Data.**

| Location ID | Chain Of Custody No | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Parameter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | 2014-2698 | CALA-14-46053 | REG | INIT | GENERAL CHEMISTRY | EPA:335.4 | Cyanide (Total) | U | UJ | I6a | N |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | INORGANIC | SW-846:6010B | Barium | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | INORGANIC | SW-846:6010B | Calcium | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | GENERAL CHEMISTRY | EPA:300.0 | Chloride | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | INORGANIC | SW-846:6010B | Magnesium | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | INORGANIC | SW-846:6010B | Potassium | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | INORGANIC | SW-846:6010B | Silicon Dioxide | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | INORGANIC | SW-846:6010B | Sodium | N | J+ | I6b | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | INORGANIC | SW-846:6010B | Strontium | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | | J | I10a | Y |
| Vine Tree Spring | 2014-2698 | CALA-14-46054 | REG | INIT | INORGANIC | SW-846:6010B | Vanadium | | J | I10a | Y |

| **Reason Code** | Description |
|---|---|
| I10a | The sample and the duplicate sample results were >=5X the RL and the duplicate RPD was >20% for water samples and >35% for soil samples. |
| I6a | The associated matrix spike recovery was below the lower acceptance limit (LAL) but >10%. Follow the external laboratory limits located within the associated data package. |
| I6b | The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. |

for:

| RPD Limit |
|---|
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |

| Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent Moisture | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | ug/L | 0.005 | mg/L | | | W | 12/17/2013 | | 1355464 | VAL | Y |
| 49.6 | ug/L | 49.6 | ug/L | | | W | 12/17/2013 | | 1355210 | VAL | Y |
| 27900 | ug/L | 27.9 | mg/L | | | W | 12/17/2013 | | 1355210 | VAL | Y |
| 17.5 | mg/L | 17.5 | mg/L | | | W | 12/17/2013 | | 1355133 | VAL | Y |
| 0.486 | mg/L | 0.486 | mg/L | | | W | 12/17/2013 | | 1355133 | VAL | Y |
| 7860 | ug/L | 7.86 | mg/L | | | W | 12/17/2013 | | 1355210 | VAL | Y |
| 5270 | ug/L | 5.27 | mg/L | | | W | 12/17/2013 | | 1355210 | VAL | Y |
| 45300 | ug/L | 45.3 | mg/L | | | W | 12/17/2013 | | 1355210 | VAL | Y |
| 18100 | ug/L | 18.1 | mg/L | | | W | 12/17/2013 | | 1355210 | VAL | Y |
| 139 | ug/L | 139 | ug/L | | | W | 12/17/2013 | | 1355210 | VAL | Y |
| 21.7 | mg/L | 21.7 | mg/L | | | W | 12/17/2013 | | 1355133 | VAL | Y |
| 8.06 | ug/L | 8.06 | ug/L | | | W | 12/17/2013 | | 1355210 | VAL | Y |

for:

| | |
|---|---|
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

**14. Useable Result Count.**

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total No. Of Records |
|---|---|---|---|---|---|
| CALA-14-46053 | Vine Tree Spring | REG | EPA:245.2 | 0 | 1 |
| CALA-14-46053 | Vine Tree Spring | REG | EPA:335.4 | 0 | 1 |
| CALA-14-46053 | Vine Tree Spring | REG | EPA:351.2 | 0 | 1 |
| CALA-14-46053 | Vine Tree Spring | REG | SW-846:8260B | 0 | 80 |
| CALA-14-46053 | Vine Tree Spring | REG | SW-846:9060 | 0 | 1 |
| CALA-14-46054 | Vine Tree Spring | REG | EPA:120.1 | 0 | 1 |
| CALA-14-46054 | Vine Tree Spring | REG | EPA:150.1 | 0 | 1 |
| CALA-14-46054 | Vine Tree Spring | REG | EPA:160.1 | 0 | 1 |
| CALA-14-46054 | Vine Tree Spring | REG | EPA:245.2 | 0 | 1 |
| CALA-14-46054 | Vine Tree Spring | REG | EPA:300.0 | 0 | 4 |
| CALA-14-46054 | Vine Tree Spring | REG | EPA:310.1 | 0 | 2 |
| CALA-14-46054 | Vine Tree Spring | REG | SM:A2340B | 0 | 1 |
| CALA-14-46054 | Vine Tree Spring | REG | SW-846:6010B | 0 | 17 |
| CALA-14-46054 | Vine Tree Spring | REG | SW-846:6020 | 0 | 11 |
| CALA-14-46054 | Vine Tree Spring | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

January 15, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Water Samples
Work Order: 339627
SDG: 2014-2698

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on December 19, 2013, and analyzed for GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2014-2698
Enclosures

**ARS International (63641-10)**
**LANL-WQH Water Samples**
**Work Order #: 339627**
**SDG: 2014-2698**

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# Case Narrative

**Case Narrative for**
**ARS International (63641-10)**
**LANL-WQH Water Samples**
**Workorder #: 339627**
**SDG # : 2014-2698**

**January 15, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on December 19, 2013 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 339627001 | CALA-14-46053 |
| 339627002 | CALA-14-46054 |
| 339627003 | CALA-14-46055 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 15 January 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−13−8 |
| Utah NELAP | SC000122013−11 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

339627

**COC/Lab Request #:** 2014-2698

Page 1 of 1

**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:**

**Lab Reporting Limit Type:**

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8260B-VOA | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-46053 | Dec 17 2013 | 09:45 | W | 1 | 2 | | 1 | | | 1 |
| CALA-14-46054 | Dec 17 2013 | 09:45 | W | | | 1 | | 1 | 1 | |
| CALA-14-46055 | Dec 17 2013 | 09:45 | W | | 2 | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | Melissa Montoya | 12/18/13 3:00 | P. Ward | Patricia Dent | 12.19.13 0850 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| **Client:** LANL | **SDG/AR/COC/Work Order:** 2014-2698 |
| **Received By:** P. Ulent | **Date Received:** 12/19/13 |

| **Suspected Hazard Information** | **Yes** | **No** | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | X | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0CPM |
| Classified Radioactive II or III by RSO? | | X | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | X | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | X | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | X | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | X | |

| | **Sample Receipt Criteria** | **Yes** | **NA** | **No** | **Comments/Qualifiers (Required for Non-Conforming Items)** |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) 3-5 18 |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | X | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | X | | | Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966 |
| 3 | Chain of custody documents included with shipment? | X | | | |
| 4 | Sample containers intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | X | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | X | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | X | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | X | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | X | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | X | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | | | X | Sample ID's affected: SEE Continuation SHEET |
| 12 | Are sample containers identifiable as GEL provided? | | | X | clients |
| 13 | COC form is properly signed in relinquished/received sections? | X | | | |
| 14 | Carrier and tracking number. | X | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other<br>5908 1776 5830-3c<br>5908 1776 5819<br>5908 1776 5841 4c<br>5908 1776 5863<br>5908 1776 5874 5c<br>5908 1776 5852<br>5908 1776 5820-18c |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HT Date 12/19/13 Page 1 of 2

GEL Laboratories LLC **SAMPLE RECEIPT & REVIEW CONTINUATION FORM**

Client: LANL Received By: P.D. Date Received: 12-19-13 SDG/AR/COC/Work Order: 2014-2698

RN # 2014-2697
CAWR-14-42131
RN# 2014-2698 } The Lab did not receive Any VOA Containers.
CALA-14-46055

RN# 2014-2699
CAPA-14-49355 - The lab recd (1) EDB Chain indicates (2).
CAPA-14-49376 - The Lab recd (3) SVOA's Chain indicates (4).
CAPA-14-49355 - The lab recd (1) VOA chain indicates (2)

RN# 2014-2700
CAPA-14-49372 - The lab recd (1) EDB Container Chain indicates (2)
CAPA-14-49373 - The Lab recd (1) 8260b Chain indicates (2)
CAPA-14-49399 - The Lab recd (3) SVOA's chain indicates (4).

PM (or PMA) review: Initials HH Date ~~12-21~~ 12-19-13 Page 2 of 2

**Subject:** Sample receipt issue from 12/19/13
**From:** Pat Dent <Pat.Dent@gel.com>
**Date:** 12/20/2013 8:43 AM
**To:** "Keith R. Greene" <kgreene@lanl.gov>
**CC:** "team.davis" <team.davis@gel.com>, LANL@amrad.com

RN#2014-2697
CAWR-14-42131 the lab did not receive any VOA containers

RN#2014-2698
CALA-14-46055 the lab did not receive any VOA containers.

RN#2014-2699
CAPA-14-49355 the lab received 1 EDB container
CAPA-14-49376 the lab received 3 SVOA containers
CAPA-14-49355, 49372 the lab received 1 container each for 8260b.

PD 12-20-13
~~CAPA-14-2700~~ RN # 2014-2700
CAPA-14-49372 the lab received 1 EDB container
CAPA-14-49373 the lab received 1 8260b and 1 EDB container.
CAPA-14-49399 the lab received 3 SVOA containers.

Thanks!!

--
Patricia Dent
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Rd.
Charleston, S.C. 29407
Main: 843-556-8171 Ext 4264
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ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18DEC13
ACTWGT: 16.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

3C

518C4/99D5/6F03

FedEx Express

J131113052301 26

2 of 3
MPS# 0263 5908 1776 5830
Mstr# 5908 1776 5820 0201

THU - 19 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RITZ 08/10

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18DEC13
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR3A0516BZA0

4C

518C4/99D5/6F03

FedEx Express

J131113052301 26

TRK# 0201 5908 1776 5819

THU - 19 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RITZ 08/10

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18DEC13
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

518C4/99D5/6F03

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

5C

FedEx
Express

J131113052301 26

2 of 3

MPS# 0263 5908 1776 5863

Mstr# 5908 1776 5852

0201

THU - 19 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 08/10

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18DEC13
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

5c

51BC4/99D5/6F03

FedEx Express

J131113052301 26

3 of 3

MPS# 0263 5908 1776 5874

Mstr# 5908 1776 5852

0201

THU - 19 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RITZ 08/10

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18DEC13
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

18c

51BC4/99D5/6F03

FedEx Express

J131113052301 26

1 of 3

TRK# 0201 5908 1776 5820

## MASTER ##

THU - 19 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RITZ 08/10

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18DEC13
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

4c

518C4/99D5/6F03

FedEx Express

J131113052301 26

3 of 3

MPS# 0263 5908 1776 5841

Mstr# 5908 1776 5820

0201

THU - 19 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 08/10

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18DEC13
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

5c

518C4/99D5/6F03

FedEx Express

J131113052301 26

1 of 3

TRK# 0201 5908 1776 5852

## MASTER ##

THU - 19 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 08/10

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# Case Narrative

**ChemStation Case Narrative**
**ARS International (ARSL)**
**SDG 2014-2698**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer** |
| Analytical Method: | SW846 8260B DOE-AL |
| Analytical Batch Number: | 1356833 |

## Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|---|---|
| 339627001 | CALA-14-46053 |
| 1203011874 | Method Blank (MB) |
| 1203011875 | 339625001(CAWR-13-42145) Post Spike (PS) |
| 1203011876 | 339625001(CAWR-13-42145) Post Spike Duplicate (PSD) |
| 1203011877 | Laboratory Control Sample (LCS) |
| 1203011878 | Laboratory Control Sample (LCS) |
| 1203011879 | 339625001(CAWR-13-42145) Post Spike (PS) |
| 1203011880 | 339625001(CAWR-13-42145) Post Spike Duplicate (PSD) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a ’d’ qualifier.

## Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Blank (MB) Statement**
The blank analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

**Laboratory Control Sample (LCS) Recovery**
The LCS 1203011877 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. See the Data Exception Report in the miscellaneous section of the data package.

**QC Sample Designation**
Sample 339625001 (CAWR-13-42145) was designated for spike analysis.

**Matrix Spike (PS) Recovery Statement**
The spike recoveries were within the required acceptance limits.

**Matrix Spike Duplicate (PSD) Recovery Statement**
The spike duplicate recoveries were within the required acceptance limits.

**Relative Percent Difference (RPD) Statement**
The RPDs between the matrix spike pair met the acceptance limits.

**Internal Standard (ISTD) Acceptance**
The internal standard responses in all client and quality control samples met the required acceptance criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Sample Preservation and Integrity**
All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-analyses were not required for samples in this SDG.

## Miscellaneous Information

### Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### Data Exception (DER) Documentation
The following DER was generated for this SDG: 1259748.

### Manual Integrations
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

### TIC Comment
Tentatively identified compounds (TIC) were requested for this sample delivery group/work order. Please note that non-requested target analytes that are reported on the quantitation reports will be present on the Form I. These detected analytes are included in the calibrated method and as a result will be reported on the Sample Data Summary (Form I) or Certificate of Analysis (C of A). TIC data are included on the Sample Data Summary (Form I).

### Additional Comments
Additional comments were not required for this SDG.

### Residual Chlorine
Residual Chlorine was not detected in any of the samples in this SDG.

## System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|---|---|---|---|---|---|
| VOA6.I | Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler | HP6890N/HP5975 | DB-624 | J&W, 60m x 0.25mm x 1.4um | Trap 10 |

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2698  GEL Work Order: 339627

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert  **Name: Erin Haubert**

**Date: 15 JAN 2014**  **Title: Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **339627001** | **Date Received:** | **12/19/2013 09:50** | | |
| | | **Client:** | **ARSL001** | **Project:** | **ESHL00210** |
| **Client ID:** | **CALA-14-46053** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 17:50** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 17:50** | | | | |
| **Data File:** | **122913V6\6O711.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **339627001** | **Date Received:** | **12/19/2013 09:50** | | |
| | | **Client:** | **ARSL001** | **Project:** | **ESHL00210** |
| **Client ID:** | **CALA-14-46053** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 17:50** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 17:50** | | | | |
| **Data File:** | **122913V6\6O711.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **339627001** | **Date Received:** | **12/19/2013 09:50** | | |
| | | **Client:** | **ARSL001** | **Project:** | **ESHL00210** |
| **Client ID:** | **CALA-14-46053** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 17:50** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 17:50** | | | | |
| **Data File:** | **122913V6\6O711.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 51.0 | 50.0 | ug/L | 102 | (78%-124%) |
| Bromofluorobenzene | 51.1 | 50.0 | ug/L | 102 | (80%-120%) |
| Toluene-d8 | 51.6 | 50.0 | ug/L | 103 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown siloxane | 13.848 | 6.02 | ug/L | 0 | J |

# Quality Control Summary

**Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-2698**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|---|---|---|---|---|
| 1203011877 | LCS for batch 1356833 | 101 | 100 | 96 |
| 1203011878 | LCS for batch 1356833 | 96 | 98 | 93 |
| 1203011874 | MB for batch 1356833 | 96 | 97 | 97 |
| 339627001 | CALA-14-46053 | 102 | 103 | 102 |
| 1203011875 | CAWR-13-42145PS | 99 | 99 | 94 |
| 1203011876 | CAWR-13-42145PSD | 97 | 97 | 93 |
| 1203011879 | CAWR-13-42145PS | 99 | 100 | 96 |
| 1203011880 | CAWR-13-42145PSD | 95 | 98 | 94 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| DCED4 | = 1,2-Dichloroethane-d4 | (78%-124%) |
| TOL | = Toluene-d8 | (80%-120%) |
| BFB | = Bromofluorobenzene | (80%-120%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PS**
**Lab Sample ID** **1203011875**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 22:10**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PS | m,p-Xylenes | 100 | 0.00 | U | 99.3 | 99 | 72-120 |
| 75-05-8 | PS | Acetonitrile | 1250 | 0.00 | U | 1050 | 84 | 61-135 |
| 67-64-1 | PS | Acetone | 250 | 0.00 | U | 104 | 41 | 29-144 |
| 74-88-4 | PS | Iodomethane | 250 | 0.00 | U | 268 | 107 | 73-120 |
| 75-15-0 | PS | Carbon disulfide | 250 | 0.00 | U | 258 | 103 | 79-138 |
| 108-05-4 | PS | Vinyl acetate | 250 | 0.00 | U | 198 | 79 | 60-136 |
| 78-93-3 | PS | 2-Butanone | 250 | 0.00 | U | 160 | 64 | 38-136 |
| 108-10-1 | PS | 4-Methyl-2-pentanone | 250 | 0.00 | U | 216 | 87 | 70-132 |
| 591-78-6 | PS | 2-Hexanone | 250 | 0.00 | U | 174 | 70 | 48-137 |
| 75-71-8 | PS | Dichlorodifluoromethane | 50.0 | 0.00 | U | 52.2 | 104 | 51-133 |
| 74-87-3 | PS | Chloromethane | 50.0 | 0.00 | U | 49.5 | 99 | 54-135 |
| 75-01-4 | PS | Vinyl chloride | 50.0 | 0.00 | U | 55.5 | 111 | 52-129 |
| 74-83-9 | PS | Bromomethane | 50.0 | 0.00 | U | 56.3 | 113 | 67-128 |
| 75-00-3 | PS | Chloroethane | 50.0 | 0.00 | U | 49.7 | 99 | 69-120 |
| 75-69-4 | PS | Trichlorofluoromethane | 50.0 | 0.00 | U | 53.8 | 108 | 66-126 |
| 60-29-7 | PS | Ethyl ether | 50.0 | 0.00 | U | 48.7 | 97 | 69-120 |
| 75-35-4 | PS | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 45.8 | 92 | 74-130 |
| 75-09-2 | PS | Methylene chloride | 50.0 | 0.00 | U | 48.6 | 97 | 73-120 |
| 1634-04-4 | PS | tert-Butyl methyl ether | 50.0 | 0.00 | U | 47.6 | 95 | 71-124 |
| 156-60-5 | PS | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 46.0 | 92 | 75-124 |
| 75-34-3 | PS | 1,1-Dichloroethane | 50.0 | 0.00 | U | 47.1 | 94 | 76-122 |
| 156-59-2 | PS | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 47.3 | 95 | 77-121 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PS**
**Lab Sample ID** **1203011875**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 22:10**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PS | 2,2-Dichloropropane | 50.0 | 0.00 | U | 48.5 | 97 | 72-129 |
| 74-97-5 | PS | Bromochloromethane | 50.0 | 0.00 | U | 51.8 | 104 | 78-122 |
| 67-66-3 | PS | Chloroform | 50.0 | 0.00 | U | 48.7 | 97 | 75-123 |
| 71-55-6 | PS | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 49.7 | 99 | 76-129 |
| 563-58-6 | PS | 1,1-Dichloropropene | 50.0 | 0.00 | U | 47.9 | 96 | 76-125 |
| 56-23-5 | PS | Carbon tetrachloride | 50.0 | 0.00 | U | 51.3 | 103 | 76-132 |
| 107-06-2 | PS | 1,2-Dichloroethane | 50.0 | 0.00 | U | 48.2 | 96 | 68-128 |
| 71-43-2 | PS | Benzene | 50.0 | 0.00 | U | 47.5 | 95 | 75-120 |
| 79-01-6 | PS | Trichloroethylene | 50.0 | 0.00 | U | 49.9 | 100 | 75-125 |
| 78-87-5 | PS | 1,2-Dichloropropane | 50.0 | 0.00 | U | 47.8 | 96 | 75-120 |
| 74-95-3 | PS | Dibromomethane | 50.0 | 0.00 | U | 48.6 | 97 | 77-122 |
| 75-27-4 | PS | Bromodichloromethane | 50.0 | 0.00 | U | 48.3 | 97 | 76-129 |
| 10061-01-5 | PS | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 49.0 | 98 | 75-127 |
| 108-88-3 | PS | Toluene | 50.0 | 0.00 | U | 48.5 | 97 | 72-120 |
| 10061-02-6 | PS | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 46.3 | 93 | 73-123 |
| 79-00-5 | PS | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 45.8 | 92 | 77-120 |
| 142-28-9 | PS | 1,3-Dichloropropane | 50.0 | 0.00 | U | 46.7 | 93 | 73-120 |
| 127-18-4 | PS | Tetrachloroethylene | 50.0 | 0.00 | U | 53.1 | 106 | 67-124 |
| 124-48-1 | PS | Dibromochloromethane | 50.0 | 0.00 | U | 47.4 | 95 | 70-130 |
| 106-93-4 | PS | 1,2-Dibromoethane | 50.0 | 0.00 | U | 48.7 | 97 | 79-122 |
| 108-90-7 | PS | Chlorobenzene | 50.0 | 0.00 | U | 50.1 | 100 | 74-120 |
| 100-41-4 | PS | Ethylbenzene | 50.0 | 0.00 | U | 48.4 | 97 | 72-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PS**
**Lab Sample ID** **1203011875**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 22:10**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 95-47-6 | PS | o-Xylene | 50.0 | 0.00 | U | 48.9 | 98 | 72-120 |
| 100-42-5 | PS | Styrene | 50.0 | 0.00 | U | 49.7 | 99 | 74-124 |
| 75-25-2 | PS | Bromoform | 50.0 | 0.00 | U | 47.9 | 96 | 61-135 |
| 98-82-8 | PS | Isopropylbenzene | 50.0 | 0.00 | U | 46.4 | 93 | 71-124 |
| 79-34-5 | PS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 44.0 | 88 | 74-124 |
| 96-18-4 | PS | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 45.0 | 90 | 71-125 |
| 108-86-1 | PS | Bromobenzene | 50.0 | 0.00 | U | 48.4 | 97 | 72-120 |
| 103-65-1 | PS | n-Propylbenzene | 50.0 | 0.00 | U | 47.1 | 94 | 69-121 |
| 108-67-8 | PS | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 46.8 | 94 | 71-123 |
| 95-49-8 | PS | 2-Chlorotoluene | 50.0 | 0.00 | U | 47.6 | 95 | 71-120 |
| 106-43-4 | PS | 4-Chlorotoluene | 50.0 | 0.00 | U | 45.4 | 91 | 70-120 |
| 98-06-6 | PS | tert-Butylbenzene | 50.0 | 0.00 | U | 49.6 | 99 | 72-124 |
| 95-63-6 | PS | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 46.0 | 92 | 71-122 |
| 135-98-8 | PS | sec-Butylbenzene | 50.0 | 0.00 | U | 48.0 | 96 | 71-124 |
| 99-87-6 | PS | 4-Isopropyltoluene | 50.0 | 0.00 | U | 49.8 | 100 | 70-124 |
| 541-73-1 | PS | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 47.9 | 96 | 70-120 |
| 106-46-7 | PS | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 44.3 | 89 | 70-120 |
| 104-51-8 | PS | n-Butylbenzene | 50.0 | 0.00 | U | 49.2 | 98 | 69-125 |
| 96-12-8 | PS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 | U | 46.8 | 94 | 60-130 |
| 87-68-3 | PS | Hexachlorobutadiene | 50.0 | 0.00 | U | 55.9 | 112 | 60-129 |
| 91-20-3 | PS | Naphthalene | 50.0 | 0.00 | U | 53.7 | 107 | 58-134 |
| 87-61-6 | PS | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 52.0 | 104 | 52-132 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PS**
**Lab Sample ID** **1203011875**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 22:10**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 120-82-1 | PS | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 57.1 | 114 | 59-126 |
| 630-20-6 | PS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 50.8 | 102 | 78-128 |
| 95-50-1 | PS | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 48.9 | 98 | 72-120 |
| 71-36-3 | PS | n-Butyl alcohol | 5000 | 0.00 | U | 4560 | 91 | 64-138 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PSD**
**Lab Sample ID** **1203011876**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 22:39**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PSD | m,p-Xylenes | 100 | 0.00 | U | 97.2 | 97 | 72-120 | 2 | 0-20 |
| 75-05-8 | PSD | Acetonitrile | 1250 | 0.00 | U | 966 | 77 | 61-135 | 9 | 0-20 |
| 67-64-1 | PSD | Acetone | 250 | 0.00 | U | 94.3 | 38 | 29-144 | 9 | 0-20 |
| 74-88-4 | PSD | Iodomethane | 250 | 0.00 | U | 262 | 105 | 73-120 | 2 | 0-20 |
| 75-15-0 | PSD | Carbon disulfide | 250 | 0.00 | U | 253 | 101 | 79-138 | 2 | 0-20 |
| 108-05-4 | PSD | Vinyl acetate | 250 | 0.00 | U | 186 | 75 | 60-136 | 6 | 0-20 |
| 78-93-3 | PSD | 2-Butanone | 250 | 0.00 | U | 144 | 58 | 38-136 | 10 | 0-20 |
| 108-10-1 | PSD | 4-Methyl-2-pentanone | 250 | 0.00 | U | 199 | 80 | 70-132 | 8 | 0-20 |
| 591-78-6 | PSD | 2-Hexanone | 250 | 0.00 | U | 159 | 64 | 48-137 | 9 | 0-20 |
| 75-71-8 | PSD | Dichlorodifluoromethane | 50.0 | 0.00 | U | 51.3 | 103 | 51-133 | 2 | 0-20 |
| 74-87-3 | PSD | Chloromethane | 50.0 | 0.00 | U | 48.2 | 96 | 54-135 | 3 | 0-20 |
| 75-01-4 | PSD | Vinyl chloride | 50.0 | 0.00 | U | 54.5 | 109 | 52-129 | 2 | 0-20 |
| 74-83-9 | PSD | Bromomethane | 50.0 | 0.00 | U | 55.7 | 111 | 67-128 | 1 | 0-20 |
| 75-00-3 | PSD | Chloroethane | 50.0 | 0.00 | U | 49.4 | 99 | 69-120 | 1 | 0-20 |
| 75-69-4 | PSD | Trichlorofluoromethane | 50.0 | 0.00 | U | 53.4 | 107 | 66-126 | 1 | 0-20 |
| 60-29-7 | PSD | Ethyl ether | 50.0 | 0.00 | U | 47.1 | 94 | 69-120 | 3 | 0-20 |
| 75-35-4 | PSD | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 44.8 | 90 | 74-130 | 2 | 0-20 |
| 75-09-2 | PSD | Methylene chloride | 50.0 | 0.00 | U | 46.8 | 94 | 73-120 | 4 | 0-20 |
| 1634-04-4 | PSD | tert-Butyl methyl ether | 50.0 | 0.00 | U | 45.2 | 90 | 71-124 | 5 | 0-20 |
| 156-60-5 | PSD | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 45.0 | 90 | 75-124 | 2 | 0-20 |
| 75-34-3 | PSD | 1,1-Dichloroethane | 50.0 | 0.00 | U | 46.2 | 92 | 76-122 | 2 | 0-20 |
| 156-59-2 | PSD | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 46.3 | 93 | 77-121 | 2 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PSD**
**Lab Sample ID** **1203011876**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 22:39**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PSD | 2,2-Dichloropropane | 50.0 | 0.00 | U | 47.6 | 95 | 72-129 | 2 | 0-20 |
| 74-97-5 | PSD | Bromochloromethane | 50.0 | 0.00 | U | 50.0 | 100 | 78-122 | 3 | 0-20 |
| 67-66-3 | PSD | Chloroform | 50.0 | 0.00 | U | 47.6 | 95 | 75-123 | 2 | 0-20 |
| 71-55-6 | PSD | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 49.1 | 98 | 76-129 | 1 | 0-20 |
| 563-58-6 | PSD | 1,1-Dichloropropene | 50.0 | 0.00 | U | 47.5 | 95 | 76-125 | 1 | 0-20 |
| 56-23-5 | PSD | Carbon tetrachloride | 50.0 | 0.00 | U | 50.9 | 102 | 76-132 | 1 | 0-20 |
| 107-06-2 | PSD | 1,2-Dichloroethane | 50.0 | 0.00 | U | 46.3 | 93 | 68-128 | 4 | 0-20 |
| 71-43-2 | PSD | Benzene | 50.0 | 0.00 | U | 46.7 | 93 | 75-120 | 2 | 0-20 |
| 79-01-6 | PSD | Trichloroethylene | 50.0 | 0.00 | U | 49.5 | 99 | 75-125 | 1 | 0-20 |
| 78-87-5 | PSD | 1,2-Dichloropropane | 50.0 | 0.00 | U | 47.0 | 94 | 75-120 | 2 | 0-20 |
| 74-95-3 | PSD | Dibromomethane | 50.0 | 0.00 | U | 47.2 | 94 | 77-122 | 3 | 0-20 |
| 75-27-4 | PSD | Bromodichloromethane | 50.0 | 0.00 | U | 47.4 | 95 | 76-129 | 2 | 0-20 |
| 10061-01-5 | PSD | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 48.2 | 96 | 75-127 | 2 | 0-20 |
| 108-88-3 | PSD | Toluene | 50.0 | 0.00 | U | 47.2 | 94 | 72-120 | 3 | 0-20 |
| 10061-02-6 | PSD | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 44.5 | 89 | 73-123 | 4 | 0-20 |
| 79-00-5 | PSD | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 44.2 | 88 | 77-120 | 3 | 0-20 |
| 142-28-9 | PSD | 1,3-Dichloropropane | 50.0 | 0.00 | U | 44.7 | 89 | 73-120 | 4 | 0-20 |
| 127-18-4 | PSD | Tetrachloroethylene | 50.0 | 0.00 | U | 52.2 | 104 | 67-124 | 2 | 0-20 |
| 124-48-1 | PSD | Dibromochloromethane | 50.0 | 0.00 | U | 46.0 | 92 | 70-130 | 3 | 0-20 |
| 106-93-4 | PSD | 1,2-Dibromoethane | 50.0 | 0.00 | U | 46.5 | 93 | 79-122 | 5 | 0-20 |
| 108-90-7 | PSD | Chlorobenzene | 50.0 | 0.00 | U | 49.1 | 98 | 74-120 | 2 | 0-20 |
| 100-41-4 | PSD | Ethylbenzene | 50.0 | 0.00 | U | 47.4 | 95 | 72-120 | 2 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PSD**
**Lab Sample ID** **1203011876**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 22:39**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-47-6 | PSD | o-Xylene | 50.0 | 0.00 | U | 47.7 | 95 | 72-120 | 3 | 0-20 |
| 100-42-5 | PSD | Styrene | 50.0 | 0.00 | U | 48.4 | 97 | 74-124 | 3 | 0-20 |
| 75-25-2 | PSD | Bromoform | 50.0 | 0.00 | U | 46.3 | 93 | 61-135 | 3 | 0-20 |
| 98-82-8 | PSD | Isopropylbenzene | 50.0 | 0.00 | U | 46.1 | 92 | 71-124 | 1 | 0-20 |
| 79-34-5 | PSD | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 41.5 | 83 | 74-124 | 6 | 0-20 |
| 96-18-4 | PSD | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 42.4 | 85 | 71-125 | 6 | 0-20 |
| 108-86-1 | PSD | Bromobenzene | 50.0 | 0.00 | U | 47.8 | 96 | 72-120 | 1 | 0-20 |
| 103-65-1 | PSD | n-Propylbenzene | 50.0 | 0.00 | U | 46.9 | 94 | 69-121 | 0 | 0-20 |
| 108-67-8 | PSD | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 46.4 | 93 | 71-123 | 1 | 0-20 |
| 95-49-8 | PSD | 2-Chlorotoluene | 50.0 | 0.00 | U | 47.4 | 95 | 71-120 | 0 | 0-20 |
| 106-43-4 | PSD | 4-Chlorotoluene | 50.0 | 0.00 | U | 44.9 | 90 | 70-120 | 1 | 0-20 |
| 98-06-6 | PSD | tert-Butylbenzene | 50.0 | 0.00 | U | 50.1 | 100 | 72-124 | 1 | 0-20 |
| 95-63-6 | PSD | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 45.4 | 91 | 71-122 | 1 | 0-20 |
| 135-98-8 | PSD | sec-Butylbenzene | 50.0 | 0.00 | U | 48.0 | 96 | 71-124 | 0 | 0-20 |
| 99-87-6 | PSD | 4-Isopropyltoluene | 50.0 | 0.00 | U | 49.1 | 98 | 70-124 | 1 | 0-20 |
| 541-73-1 | PSD | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 47.5 | 95 | 70-120 | 1 | 0-20 |
| 106-46-7 | PSD | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 44.0 | 88 | 70-120 | 1 | 0-20 |
| 104-51-8 | PSD | n-Butylbenzene | 50.0 | 0.00 | U | 49.0 | 98 | 69-125 | 0 | 0-20 |
| 96-12-8 | PSD | 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 | U | 44.4 | 89 | 60-130 | 5 | 0-20 |
| 87-68-3 | PSD | Hexachlorobutadiene | 50.0 | 0.00 | U | 56.1 | 112 | 60-129 | 0 | 0-20 |
| 91-20-3 | PSD | Naphthalene | 50.0 | 0.00 | U | 54.0 | 108 | 58-134 | 1 | 0-20 |
| 87-61-6 | PSD | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 52.7 | 105 | 52-132 | 1 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PSD**
**Lab Sample ID** **1203011876**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 22:39**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-82-1 | PSD | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 57.1 | 114 | 59-126 | 0 | 0-20 |
| 630-20-6 | PSD | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 49.7 | 99 | 78-128 | 2 | 0-20 |
| 95-50-1 | PSD | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 48.3 | 97 | 72-120 | 1 | 0-20 |
| 71-36-3 | PSD | n-Butyl alcohol | 5000 | 0.00 | U | 4030 | 81 | 64-138 | 12 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **LCS for batch 1356833**
**Lab Sample ID** **1203011877**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **12/29/2013 13:58**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 103 | 103 | 80-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 1120 | 89 | 63-131 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 234 | 93 | 50-149 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 273 | 109 | 75-120 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 271 | 108 | 80-136 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 218 | 87 | 78-130 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 257 | 103 | 57-148 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 223 | 89 | 75-130 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 253 | 101 | 64-149 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 56.1 | 112 | 58-129 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 49.9 | 100 | 59-131 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 57.6 | 115 | 59-127 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 57.8 | 116 | 70-125 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 51.8 | 104 | 73-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 57.2 | 114 | 73-123 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 49.5 | 99 | 73-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 48.5 | 97 | 80-128 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 48.6 | 97 | 75-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 47.6 | 95 | 74-122 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 47.2 | 94 | 80-121 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 48.1 | 96 | 79-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 48.2 | 96 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **LCS for batch 1356833**
**Lab Sample ID** **1203011877**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **12/29/2013 13:58**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 52.0 | 104 | 79-130 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 50.9 | 102 | 80-121 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 49.2 | 98 | 79-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 52.0 | 104 | 80-128 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 49.8 | 100 | 80-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 54.5 | 109 | 80-131 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 48.1 | 96 | 73-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 48.5 | 97 | 78-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 51.8 | 104 | 80-121 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 48.4 | 97 | 79-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 49.2 | 98 | 80-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 49.3 | 99 | 80-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 50.2 | 100 | 80-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 49.4 | 99 | 78-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 47.4 | 95 | 79-121 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 46.4 | 93 | 78-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 47.1 | 94 | 75-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 56.4 | 113 | 74-123 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 48.3 | 97 | 73-129 |
| 106-93-4 | LCS | 1,2-Dibromoethane | 50.0 | 0.0 | 48.9 | 98 | 80-120 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 50.9 | 102 | 79-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 50.3 | 101 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **LCS for batch 1356833**
**Lab Sample ID** **1203011877**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **12/29/2013 13:58**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 50.2 | 100 | 80-123 |
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 51.3 | 103 | 80-121 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 48.7 | 97 | 65-135 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 48.6 | 97 | 79-121 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 44.1 | 88 | 76-123 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 45.6 | 91 | 76-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 49.4 | 99 | 79-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 50.4 | 101 | 80-123 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 49.4 | 99 | 80-120 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 49.6 | 99 | 79-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 47.8 | 96 | 79-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 52.8 | 106 | 79-122 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 48.3 | 97 | 80-120 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 51.8 | 104 | 80-121 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 53.6 | 107 | 80-121 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 50.7 | 101 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 46.7 | 93 | 78-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 55.0 | 110 | 80-123 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.0 | 49.1 | 98 | 66-125 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 62.4 | 125 | 71-128 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 59.7 | 119 | 64-132 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 59.3 | 119 | 61-132 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **LCS for batch 1356833**
**Lab Sample ID** **1203011877**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **12/29/2013 13:58**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 66.2 | 132 * | 66-130 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 51.5 | 103 | 80-125 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 50.9 | 102 | 78-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4810 | 96 | 67-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Sample Type:** **Laboratory Control Sample**
**Client ID:** **LCS for batch 1356833**
**Matrix:** **WATER**
**Lab Sample ID** **1203011878**
**Instrument:** **VOA6.I**
**Analysis Date:** **12/29/2013 15:25**
**Dilution: 1**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 231 | 92 | 65-126 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 278 | 111 | 73-132 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 237 | 95 | 67-127 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 241 | 96 | 74-122 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 244 | 98 | 73-124 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 247 | 99 | 68-123 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 261 | 104 | 79-120 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 250 | 100 | 77-120 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 2470 | 99 | 72-133 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 47.1 | 94 | 57-142 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PS**
**Lab Sample ID** **1203011879**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 23:08**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PS | Acrolein | 250 | 0.00 | U | 229 | 92 | 57-131 |
| 76-13-1 | PS | Trichlorotrifluoroethane | 250 | 0.00 | U | 284 | 114 | 76-133 |
| 107-05-1 | PS | Allyl chloride | 250 | 0.00 | U | 243 | 97 | 65-130 |
| 107-13-1 | PS | Acrylonitrile | 250 | 0.00 | U | 241 | 97 | 70-128 |
| 107-12-0 | PS | Propionitrile | 250 | 0.00 | U | 242 | 97 | 68-131 |
| 126-98-7 | PS | Methacrylonitrile | 250 | 0.00 | U | 250 | 100 | 64-129 |
| 80-62-6 | PS | Methyl methacrylate | 250 | 0.00 | U | 264 | 105 | 76-120 |
| 97-63-2 | PS | Ethyl methacrylate | 250 | 0.00 | U | 254 | 101 | 72-122 |
| 78-83-1 | PS | Isobutyl alcohol | 2500 | 0.00 | U | 2360 | 94 | 72-134 |
| 126-99-8 | PS | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 47.9 | 96 | 46-140 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-2698**
**Client ID:** **CAWR-13-42145PSD**
**Lab Sample ID** **1203011880**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **12/29/2013 23:36**
**Dilution: 1**
**Batch ID:** **1356833**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PSD | Acrolein | 250 | 0.00 | U | 224 | 90 | 57-131 | 2 | 0-20 |
| 76-13-1 | PSD | Trichlorotrifluoroethane | 250 | 0.00 | U | 277 | 111 | 76-133 | 3 | 0-20 |
| 107-05-1 | PSD | Allyl chloride | 250 | 0.00 | U | 235 | 94 | 65-130 | 3 | 0-20 |
| 107-13-1 | PSD | Acrylonitrile | 250 | 0.00 | U | 233 | 93 | 70-128 | 4 | 0-20 |
| 107-12-0 | PSD | Propionitrile | 250 | 0.00 | U | 237 | 95 | 68-131 | 2 | 0-20 |
| 126-98-7 | PSD | Methacrylonitrile | 250 | 0.00 | U | 239 | 96 | 64-129 | 4 | 0-20 |
| 80-62-6 | PSD | Methyl methacrylate | 250 | 0.00 | U | 253 | 101 | 76-120 | 4 | 0-20 |
| 97-63-2 | PSD | Ethyl methacrylate | 250 | 0.00 | U | 245 | 98 | 72-122 | 3 | 0-20 |
| 78-83-1 | PSD | Isobutyl alcohol | 2500 | 0.00 | U | 2330 | 93 | 72-134 | 1 | 0-20 |
| 126-99-8 | PSD | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 46.4 | 93 | 46-140 | 3 | 0-20 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Client:** | **ARSL001** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1356833** | **Instrument ID:** | **VOA6.I** | **Data File:** | **122913V6\6O708BAR.D** |
| **Lab Sample ID:** | **1203011874** | **Prep Date:** | **12/29/2013 16:23** | **Analyzed:** | **12/29/13 16:23** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| | Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 01 | LCS for batch 1356833 | 1203011877 | 122913V6\6O703LAR.D | 12/29/13 | 1358 |
| 02 | LCS for batch 1356833 | 1203011878 | 122913V6\6O706SHAR.D | 12/29/13 | 1525 |
| 03 | CALA-14-46053 | 339627001 | 122913V6\6O711.D | 12/29/13 | 1750 |
| 04 | CAWR-13-42145PS | 1203011875 | 122913V6\6O720.D | 12/29/13 | 2210 |
| 05 | CAWR-13-42145PSD | 1203011876 | 122913V6\6O721.D | 12/29/13 | 2239 |
| 06 | CAWR-13-42145PS | 1203011879 | 122913V6\6O722.D | 12/29/13 | 2308 |
| 07 | CAWR-13-42145PSD | 1203011880 | 122913V6\6O723.D | 12/29/13 | 2336 |

# Quality Control Data

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011874** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 16:23** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 16:23** | | | | |
| **Data File:** | **122913V6\6O708BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011874** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 16:23** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 16:23** | | | | |
| **Data File:** | **122913V6\6O708BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011874** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 16:23** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 16:23** | | | | |
| **Data File:** | **122913V6\6O708BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.2 | 50.0 | ug/L | 96.5 | (78%-124%) |
| Bromofluorobenzene | 48.3 | 50.0 | ug/L | 96.5 | (80%-120%) |
| Toluene-d8 | 48.6 | 50.0 | ug/L | 97.2 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011875** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 22:10** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 22:10** | | | | |
| **Data File:** | **122913V6\6O720.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 50.8 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 49.7 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 44.0 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 45.8 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 47.1 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 45.8 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 47.9 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 52.0 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 45.0 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 57.1 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 46.0 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 46.8 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 48.7 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 48.9 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 48.2 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 47.8 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 46.8 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 47.9 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 46.7 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 44.3 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 48.5 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 160 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 47.6 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 174 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 45.4 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 49.8 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 216 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 104 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 1050 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 47.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 48.4 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 51.8 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 48.3 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 47.9 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011875** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 22:10** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 22:10** | | | | |
| **Data File:** | **122913V6\6O720.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 56.3 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 258 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 51.3 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 50.1 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 49.7 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 48.7 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 49.5 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 47.4 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 48.6 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 52.2 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 48.7 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 48.4 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 55.9 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 268 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 46.4 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 48.6 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 53.7 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 49.7 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 53.1 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 48.5 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 49.9 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 53.8 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 198 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 55.5 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 47.3 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 49.0 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 99.3 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4560 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 49.2 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 47.1 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 48.9 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 48.0 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011875** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 22:10** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 22:10** | | | | |
| **Data File:** | **122913V6\6O720.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 47.6 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 49.6 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 46.0 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 46.3 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 49.6 | 50.0 | ug/L | 99.2 | (78%-124%) |
| Bromofluorobenzene | 47.0 | 50.0 | ug/L | 94.0 | (80%-120%) |
| Toluene-d8 | 49.6 | 50.0 | ug/L | 99.2 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011876** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 22:39** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 22:39** | | | | |
| **Data File:** | **122913V6\6O721.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 49.7 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 49.1 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 41.5 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 44.2 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 46.2 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 44.8 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 47.5 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 52.7 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 42.4 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 57.1 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 45.4 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 44.4 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 46.5 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 48.3 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 46.3 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 47.0 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 46.4 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 47.5 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 44.7 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 44.0 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 47.6 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 144 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 47.4 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 159 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 44.9 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 49.1 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 199 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 94.3 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 966 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 46.7 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 47.8 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 50.0 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 47.4 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 46.3 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011876** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 22:39** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 22:39** | | | | |
| **Data File:** | **122913V6\6O721.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 55.7 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 253 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 50.9 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 49.1 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 49.4 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 47.6 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 48.2 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 46.0 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 47.2 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 51.3 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 47.1 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 47.4 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 56.1 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 262 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 46.1 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 46.8 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 54.0 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 48.4 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 52.2 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 47.2 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 49.5 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 53.4 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 186 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 54.5 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 46.3 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 48.2 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 97.2 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4030 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 49.0 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 46.9 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 47.7 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 48.0 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011876** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 22:39** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 22:39** | | | | |
| **Data File:** | **122913V6\6O721.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 45.2 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 50.1 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 45.0 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 44.5 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.3 | 50.0 | ug/L | 96.7 | (78%-124%) |
| Bromofluorobenzene | 46.5 | 50.0 | ug/L | 93.0 | (80%-120%) |
| Toluene-d8 | 48.7 | 50.0 | ug/L | 97.5 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011877** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 13:58** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 13:58** | | | | |
| **Data File:** | **122913V6\6O703LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 51.5 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 52.0 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 44.1 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 46.4 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 48.1 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 48.5 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 49.8 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 59.3 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 45.6 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 66.2 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 48.3 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 49.1 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 48.9 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 50.9 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 48.1 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 48.4 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 49.4 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 50.7 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 47.1 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 46.7 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 52.0 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 257 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 49.6 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 253 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 47.8 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 53.6 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 223 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 234 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 1120 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 48.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 49.4 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 50.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 49.3 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 48.7 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011877** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 13:58** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 13:58** | | | | |
| **Data File:** | **122913V6\6O703LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 57.8 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 271 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 54.5 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 50.9 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 51.8 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 49.2 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 49.9 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 48.3 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 49.2 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 56.1 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 49.5 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 50.3 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 62.4 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 273 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 48.6 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 48.6 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 59.7 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 51.3 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 56.4 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 49.4 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 51.8 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 57.2 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 218 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 57.6 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 48.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 50.2 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 103 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4810 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 55.0 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 50.4 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 50.2 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 51.8 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011877** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 13:58** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 13:58** | | | | |
| **Data File:** | **122913V6\6O703LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 47.6 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 52.8 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 47.2 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 47.4 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.4 | 50.0 | ug/L | 101 | (78%-124%) |
| Bromofluorobenzene | 47.9 | 50.0 | ug/L | 95.7 | (80%-120%) |
| Toluene-d8 | 49.9 | 50.0 | ug/L | 99.8 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011878** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 15:25** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 15:25** | | | | |
| **Data File:** | **122913V6\6O706SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 47.1 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 231 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 241 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 237 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011878** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 15:25** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 15:25** | | | | |
| **Data File:** | **122913V6\6O706SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 250 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2470 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 247 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 261 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 244 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 278 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203011878** | | | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1356833** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 15:25** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 15:25** | | | | |
| **Data File:** | **122913V6\6O706SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.0 | 50.0 | ug/L | 96.0 | (78%-124%) |
| Bromofluorobenzene | 46.3 | 50.0 | ug/L | 92.6 | (80%-120%) |
| Toluene-d8 | 48.8 | 50.0 | ug/L | 97.5 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011879** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 23:08** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 23:08** | | | | |
| **Data File:** | **122913V6\6O722.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 47.9 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 229 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 241 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 243 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011879** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 23:08** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 23:08** | | | | |
| **Data File:** | **122913V6\6O722.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 254 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2360 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 250 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 264 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 242 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 284 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011879** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 23:08** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 23:08** | | | | |
| **Data File:** | **122913V6\6O722.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 49.7 | 50.0 | ug/L | 99.3 | (78%-124%) |
| Bromofluorobenzene | 47.8 | 50.0 | ug/L | 95.6 | (80%-120%) |
| Toluene-d8 | 50.0 | 50.0 | ug/L | 100 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011880** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 23:36** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 23:36** | | | | |
| **Data File:** | **122913V6\6O723.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 46.4 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 224 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 233 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 235 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011880** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 23:36** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 23:36** | | | | |
| **Data File:** | **122913V6\6O723.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 245 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2330 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 239 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 253 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 237 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 277 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-2698** | **Date Collected:** | **12/17/2013 12:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203011880** | **Date Received:** | **12/19/2013 09:50** | | |
| **Client Sample:** | **QC for batch 1356833** | **Client:** | **ARSL001** | **Project:** | **QC** |
| **Client ID:** | **CAWR-13-42145PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1356833** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **12/29/2013 23:36** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **12/29/2013 23:36** | | | | |
| **Data File:** | **122913V6\6O723.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 47.6 | 50.0 | ug/L | 95.3 | (78%-124%) |
| Bromofluorobenzene | 46.8 | 50.0 | ug/L | 93.6 | (80%-120%) |
| Toluene-d8 | 49.1 | 50.0 | ug/L | 98.1 | (80%-120%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 14-JAN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| VOA GC/MS | SW846 8260B DOE-AL | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1356833 | See Below | | |

**Potentially affected work order(s)(SDG): 339625(2014-2697),339627(2014-2698),339631(2014-2699),339632(2014-2700)**

**Application Issues:**

Failed Recovery for LCS/LCSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. QC sample 1203011877 (LCS) recovered above the limits for 1,2,4-Trichlorobenzene at 132%. The limits are 66-130%. | 1. The unacceptable recovery was less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. |

**Originator's Name:**

Gelester Baskett 14-JAN-14

**Data Validator/Group Leader:**

Erin Haubert 15-JAN-14

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International (ARSL)**
**SDG 2014-2698**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1356870 |
| Prep Batch Number: | 1356869 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 339627002 | CALA-14-46054 |
| 1203012015 | Interference Check Sample (ICS) |
| 1203012011 | Method Blank (MB) |
| 1203012012 | Laboratory Control Sample (LCS) |
| 1203012013 | 339881002(CAMO-14-45694) Matrix Spike (MS) |
| 1203012014 | 339881002(CAMO-14-45694) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
All associated initial calibration verification standards (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 339881002 (CAMO-14-45694) from SDG 2014-2723 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Sample 339627002 (CALA-14-46054) was diluted to bring the over range concentration within the calibration range.

**Sample Re-extraction/Re-analysis**
Most of the listed samples were analyzed three times due to a the bracketing CRI not meeting the necessary acceptance criteria. It was determined after the second analysis, that sample 339880002 (WST59-14-49656) was the cause of the low recovery of Perchlorate-O(18). In the third analysis, three method blanks were analyzed after 339880002, and all samples and QC met acceptance criteria.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2698  GEL Work Order: 339627

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 10 JAN 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CALA-14-46054

**Date Received:** 19-DEC-13

**GEL Job No (SDG):** 2014-2698

**GEL Sample ID:** 339627002

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .5 | 2 | 5.66 | ug/L | | 10 | 07-JAN-14 19:05 | per0107031a |
| | Perchlorate Isotope Ratio | | | 3.17 | | | 10 | 07-JAN-14 19:05 | per0107031a |
| 14797-73-0 | Perchlorate-101 | .5 | 2 | 5.51 | ug/L | | 10 | 07-JAN-14 19:05 | per0107031a |
| | Perchlorate-O(18) | | | 4.88 | ug/L | | 10 | 07-JAN-14 19:05 | per0107031a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2014-2698

**Extract Batch Code:** 1356869

**Date Filtered:** 06-JAN-14

**Matrix:** WATER

**Sample ID:** 1203012012

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .188 | ug/L | 93.9 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.15 | | | | - |
| Perchlorate-101 | 0.200 | .18 | ug/L | 90.2 | | 85 - 115 |
| Perchlorate-O(18) | | .477 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2014-2698

**Extract Batch Code:** 1356869

**Date Extracted:** 06-JAN-14

**GEL MS/PS ID:** 1203012013

**Client ID:** CAMO-14-45694

**GEL MSD/PSD ID:** 1203012014

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.338 | ug/L | 0.533 | 97.5 | .527 | 94.4 | 1.14 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.20 | | 3.1 | | 3.15 | | 1.69 | | - |
| Perchlorate-101 | 0.200 | 0.325 | ug/L | 0.530 | 102 | .515 | 94.8 | 2.83 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.510 | ug/L | 0.517 | | .511 | | 1.1 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 06-JAN-14

**GEL Job No (SDG):** 2014-2698

**GEL Sample ID:** 1203012011

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 06-JAN-14 17:32 | per0106012a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 06-JAN-14 17:32 | per0106012a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 06-JAN-14 17:32 | per0106012a |
| | Perchlorate-O(18) | | | 0.478 | ug/L | | 1 | 06-JAN-14 17:32 | per0106012a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 06-JAN-14

**GEL Job No (SDG):** 2014-2698

**GEL Sample ID:** 1203012012

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.188 | ug/L | J | 1 | 06-JAN-14 17:40 | per0106013a |
| | Perchlorate Isotope Ratio | | | 3.15 | | | 1 | 06-JAN-14 17:40 | per0106013a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.180 | ug/L | J | 1 | 06-JAN-14 17:40 | per0106013a |
| | Perchlorate-O(18) | | | 0.477 | ug/L | | 1 | 06-JAN-14 17:40 | per0106013a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2014-2698

**GEL Sample ID:** 1203012015

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.190 | ug/L | J | 1 | 06-JAN-14 17:48 | per0106014a |
| | Perchlorate Isotope Ratio | | | 3.02 | | | 1 | 06-JAN-14 17:48 | per0106014a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.191 | ug/L | J | 1 | 06-JAN-14 17:48 | per0106014a |
| | Perchlorate-O(18) | | | 0.472 | ug/L | | 1 | 06-JAN-14 17:48 | per0106014a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-45694MS

**Date Received:** 24-DEC-13

**GEL Job No (SDG):** 2014-2698

**GEL Sample ID:** 1203012013

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.533 | ug/L | | 1 | 07-JAN-14 21:20 | per0107048a |
| | Perchlorate Isotope Ratio | | | 3.1 | | | 1 | 07-JAN-14 21:20 | per0107048a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.530 | ug/L | | 1 | 07-JAN-14 21:20 | per0107048a |
| | Perchlorate-O(18) | | | 0.517 | ug/L | | 1 | 07-JAN-14 21:20 | per0107048a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-45694MSD

**Date Received:** 24-DEC-13

**GEL Job No (SDG):** 2014-2698

**GEL Sample ID:** 1203012014

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.527 | ug/L | | 1 | 07-JAN-14 21:28 | per0107049a |
| | Perchlorate Isotope Ratio | | | 3.15 | | | 1 | 07-JAN-14 21:28 | per0107049a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.515 | ug/L | | 1 | 07-JAN-14 21:28 | per0107049a |
| | Perchlorate-O(18) | | | 0.511 | ug/L | | 1 | 07-JAN-14 21:28 | per0107049a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International (ARSL)**
**SDG 2014-2698**

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 339627001 | CALA-14-46053 |
| 339627002 | CALA-14-46054 |
| 1203007986 | Method Blank (MB) **ICP** |
| 1203007987 | Laboratory Control Sample (LCS) |
| 1203007990 | 339627002(CALA-14-46054L) Serial Dilution (SD) |
| 1203007993 | 339632006(CAPA-14-49424L) Serial Dilution (SD) |
| 1203007988 | 339627002(CALA-14-46054D) Sample Duplicate (DUP) |
| 1203007991 | 339632006(CAPA-14-49424D) Sample Duplicate (DUP) |
| 1203007989 | 339627002(CALA-14-46054S) Matrix Spike (MS) |
| 1203007992 | 339632006(CAPA-14-49424S) Matrix Spike (MS) |
| 1203007981 | Method Blank (MB) **ICP-MS** |
| 1203007982 | Laboratory Control Sample (LCS) |
| 1203007985 | 339632006(CAPA-14-49424L) Serial Dilution (SD) |
| 1203007983 | 339632006(CAPA-14-49424D) Sample Duplicate (DUP) |
| 1203007984 | 339632006(CAPA-14-49424S) Matrix Spike (MS) |
| 1203013367 | Method Blank (MB) **CVAA** |
| 1203013368 | Laboratory Control Sample (LCS) |
| 1203013373 | 339487001(CAPA-14-49397L) Serial Dilution (SD) |
| 1203013372 | 339487001(CAPA-14-49397D) Sample Duplicate (DUP) |
| 1203013374 | 339487001(CAPA-14-49397S) Matrix Spike (MS) |

## Method/Analysis Information

| | |
|---|---|
| **Analytical Batch:** | 1355210, 1355208, 1357406 and 1360300 |
| **Prep Batch :** | 1355209, 1355207 and 1357405 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 27 and GL-GC-E-107 REV# 9 |

| | |
|---|---|
| **Analytical Method:** | SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**System Configuration**

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

**Calibration Information**

**Instrument Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL Requirements**
The CRDL standard recoveries met the referenced advisory control limits.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blank (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 339627002 (CALA-14-46054)-ICP, 339632006 (CAPA-14-49424)-ICP and ICP-MS and 339487001 (CAPA-14-49397)-CVAA.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes with the exception of sodium.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established criteria of less than 10% difference (%D) with the exception of sodium.

## Technical Information

### Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

### Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

### Sample Dilutions
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

### Preparation Information
The samples in this SDG were prepared exactly according to the cited SOP.

## Miscellaneous Information

### Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER ID 1260004. A copy is included in the Miscellaneous Data section of this package.

### Additional Comments
Additional comments were not required for this SDG.

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has

met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:** Nick Cole, A Elmore **Date:** 1-15-14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2698  GEL Work Order: 339627

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

E %difference of sample and SD is >10%.  Sample concentration must meet flagging criteria

J Value is estimated

N Metals--The Matrix spike sample recovery is not within specified control limits

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by Nick Cole A Elmore 1-15-14

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−2698 **CONTRACT:** ESHL00210 **METHOD TYPE:** EPA

**SAMPLE ID:** 339627001 **BASIS:** As Received **DATE COLLECTED** 17−DEC−13

**CLIENT ID:** CALA−14−46053 **LEVEL:** Low **DATE RECEIVED** 19−DEC−13

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 01/06/14 11:11 | 010614W2−6 | 1357406 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1357406 | 1357405 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 01/03/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−2698 **CONTRACT:** ESHL00210 **METHOD TYPE:** EPA

**SAMPLE ID:** 339627002 **BASIS:** As Received **DATE COLLECTED** 17−DEC−13

**CLIENT ID:** CALA−14−46054 **LEVEL:** Low **DATE RECEIVED** 19−DEC−13

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 01/06/14 11:13 | 010614W2−6 | 1357406 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−2698 **CONTRACT:** ESHL00210 **METHOD TYPE:** SW846

**SAMPLE ID:** 339627002 **BASIS:** As Received **DATE COLLECTED** 17−DEC−13

**CLIENT ID:** CALA−14−46054 **LEVEL:** Low **DATE RECEIVED** 19−DEC−13

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 12/30/13 20:38 | 131230−3 | 1355208 |
| 7440−38−2 | Arsenic | 5 | ug/L | U | 1.7 | 5 | 5 | 1 | MS | BAJ | 01/02/14 11:18 | 140102−5 | 1355208 |
| 7440−39−3 | Barium | 49.6 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−42−8 | Boron | 27.4 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 12/30/13 20:38 | 131230−3 | 1355208 |
| 7440−70−2 | Calcium | 27900 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−47−3 | Chromium | 10 | ug/L | U | 2 | 10 | 10 | 1 | MS | BAJ | 12/30/13 20:38 | 131230−3 | 1355208 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 12/30/13 20:38 | 131230−3 | 1355208 |
| 7439−95−4 | Magnesium | 7860 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7439−98−7 | Molybdenum | 2.22 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 12/30/13 20:38 | 131230−3 | 1355208 |
| 7440−02−0 | Nickel | 0.804 | ug/L | J | 0.5 | 2 | 2 | 1 | MS | BAJ | 12/30/13 20:38 | 131230−3 | 1355208 |
| 7440−09−7 | Potassium | 5270 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7782−49−2 | Selenium | 1.97 | ug/L | J | 1.5 | 5 | 5 | 1 | MS | BAJ | 01/02/14 11:18 | 140102−5 | 1355208 |
| 7631−86−9 | Silica | 45300 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 12/30/13 20:38 | 131230−3 | 1355208 |
| 7440−23−5 | Sodium | 18100 | ug/L | N | 100 | 300 | 300 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−24−6 | Strontium | 139 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 12/30/13 20:38 | 131230−3 | 1355208 |
| 7440−31−5 | Tin | 10 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 01/14/14 13:48 | 011414−2 | 1355210 |
| 7440−61−1 | Uranium | 1.58 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 12/31/13 16:48 | 131231−4 | 1355208 |
| 7440−62−2 | Vanadium | 8.06 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 01/10/14 11:15 | 011014A−1 | 1355210 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−2698 **CONTRACT:** ESHL00210 **METHOD TYPE:**

**SAMPLE ID:** 339627002 **BASIS:** As Received **DATE COLLECTED** 17−DEC−13

**CLIENT ID:** CALA−14−46054 **LEVEL:** Low **DATE RECEIVED** 19−DEC−13

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 102 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 01/15/14 13:50 | | 1360300 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1355208 | 1355207 | SW846 3005A | 50 | mL | 50 | mL | 12/30/13 | AXG2 |
| 1355210 | 1355209 | SW846 3005A | 50 | mL | 50 | mL | 12/30/13 | AXG2 |
| 1357406 | 1357405 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 01/03/14 | AXS5 |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**
**P** **SW846 3005/6010B**
**AV** **EPA 245.1/245.2**

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2014−2698

**Contract:** ESHL00210

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203007981 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203007986 | | | | | | | | |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 53.2 | ug/L | +/−150 | J | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 182 | ug/L | +/−300 | J | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Tin | 2.95 | ug/L | +/−10 | J | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| 1203013367 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **MS** | **SW846 3005/6020 DOE−AL** |
| **P** | **SW846 3005/6010B** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2698 **Client ID** CAPA−14−49424S

**Contract:** ESHL01410 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 339632006 **Spike ID:** 1203007984

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ug/L | 75−125 | 55.7 | | 1.7 | U | 50 | 110 | | MS |
| Cadmium | ug/L | 75−125 | 53.8 | | 0.11 | U | 50 | 108 | | MS |
| Chromium | ug/L | 75−125 | 54.6 | | 2 | U | 50 | 106 | | MS |
| Lead | ug/L | 75−125 | 48.3 | | 0.5 | U | 50 | 96.6 | | MS |
| Molybdenum | ug/L | 75−125 | 51 | | 1.77 | | 50 | 98.5 | | MS |
| Antimony | ug/L | 75−125 | 52.4 | | 1 | U | 50 | 105 | | MS |
| Nickel | ug/L | 75−125 | 51.7 | | 0.5 | U | 50 | 103 | | MS |
| Selenium | ug/L | 75−125 | 56.7 | | 1.5 | U | 50 | 113 | | MS |
| Silver | ug/L | 75−125 | 51.2 | | 0.2 | U | 50 | 102 | | MS |
| Thallium | ug/L | 75−125 | 46.3 | | 0.45 | U | 50 | 92.7 | | MS |
| Uranium | ug/L | 75−125 | 49.1 | | 0.658 | | 50 | 96.8 | | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2698 **Client ID** CALA−14−46054S

**Contract:** ESHL00210 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 339627002 **Spike ID:** 1203007989

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 5220 | | 68 | U | 5000 | 103 | | P |
| Barium | ug/L | 75−125 | 569 | | 49.6 | | 500 | 104 | | P |
| Beryllium | ug/L | 75−125 | 526 | | 1 | U | 500 | 105 | | P |
| Boron | ug/L | 75−125 | 545 | | 27.4 | J | 500 | 103 | | P |
| Calcium | ug/L | | 33800 | | 27900 | | 5000 | 118 | N/A | P |
| Cobalt | ug/L | 75−125 | 502 | | 1 | U | 500 | 100 | | P |
| Copper | ug/L | 75−125 | 523 | | 3 | U | 500 | 105 | | P |
| Iron | ug/L | 75−125 | 5200 | | 30 | U | 5000 | 104 | | P |
| Magnesium | ug/L | 75−125 | 13300 | | 7860 | | 5000 | 109 | | P |
| Manganese | ug/L | 75−125 | 502 | | 2 | U | 500 | 100 | | P |
| Potassium | ug/L | 75−125 | 10500 | | 5270 | | 5000 | 104 | | P |
| Silica | ug/L | | 57900 | | 45300 | | 10700 | 117 | N/A | P |
| Sodium | ug/L | 75−125 | 24500 | | 18100 | | 5000 | 128 | N | P |
| Strontium | ug/L | 75−125 | 658 | | 139 | | 500 | 104 | | P |
| Tin | ug/L | 75−125 | 482 | | 2.5 | U | 500 | 96.4 | | P |
| Vanadium | ug/L | 75−125 | 519 | | 8.06 | | 500 | 102 | | P |
| Zinc | ug/L | 75−125 | 498 | | 3.3 | U | 500 | 99.1 | | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2698 **Client ID** CAPA−14−49424S

**Contract:** ESHL01410 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 339632006 **Spike ID:** 1203007992

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Silica | ug/L | | 85000 | | 69200 | | 10700 | 147 | N/A | P |
| Sodium | ug/L | 75−125 | 17100 | | 11000 | | 5000 | 121 | | P |
| Strontium | ug/L | 75−125 | 583 | | 60.2 | | 500 | 105 | | P |
| Tin | ug/L | 75−125 | 483 | | 2.5 | U | 500 | 96.6 | | P |
| Vanadium | ug/L | 75−125 | 529 | | 4.52 | J | 500 | 105 | | P |
| Zinc | ug/L | 75−125 | 519 | | 3.3 | U | 500 | 103 | | P |
| Aluminum | ug/L | 75−125 | 5190 | | 68 | U | 5000 | 104 | | P |
| Barium | ug/L | 75−125 | 565 | | 32.8 | | 500 | 106 | | P |
| Beryllium | ug/L | 75−125 | 540 | | 1 | U | 500 | 108 | | P |
| Boron | ug/L | 75−125 | 538 | | 15 | U | 500 | 105 | | P |
| Calcium | ug/L | 75−125 | 19400 | | 13700 | | 5000 | 113 | | P |
| Cobalt | ug/L | 75−125 | 513 | | 1 | U | 500 | 103 | | P |
| Copper | ug/L | 75−125 | 546 | | 3 | U | 500 | 109 | | P |
| Iron | ug/L | 75−125 | 5250 | | 30 | U | 5000 | 105 | | P |
| Magnesium | ug/L | 75−125 | 9830 | | 4420 | | 5000 | 108 | | P |
| Manganese | ug/L | 75−125 | 522 | | 2 | U | 500 | 104 | | P |
| Potassium | ug/L | 75−125 | 6850 | | 1820 | | 5000 | 101 | | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2698 **Client ID** CAPA−14−49397S

**Contract:** ESHL01410 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 339487001 **Spike ID:** 1203013374

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 2.06 | | 0.067 | U | 2 | 103 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2698 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** CAPA−14−49424D

**Matrix:** WATER **Level:** Low

**Sample ID:** 339632006 **Duplicate ID:** 1203007983 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | | 1.7 | U | 1.7 | U | | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | | 2 | U | 2 | U | | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 1.77 | | 1.71 | | 3.44 | | MS |
| Nickel | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−.2 | 0.658 | | 0.643 | | 2.31 | | MS |

***Analytical Methods:**

**MS SW846 3005/6020 DOE−AL**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2698 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** CALA−14−46054D

**Matrix:** WATER **Level:** Low

**Sample ID:** 339627002 **Duplicate ID:** 1203007988 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−20% | 49.6 | | 51.5 | | 3.86 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | +/−50 | 27.4 | J | 27.7 | J | 1.28 | | P |
| Calcium | ug/L | +/−20% | 27900 | | 29300 | | 4.84 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−20% | 7860 | | 8200 | | 4.18 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 5270 | | 5490 | | 4.05 | | P |
| Silica | ug/L | +/−20% | 45300 | | 47100 | | 3.88 | | P |
| Sodium | ug/L | +/−20% | 18100 | | 19300 | | 6.48 | | P |
| Strontium | ug/L | +/−20% | 139 | | 145 | | 4.46 | | P |
| Tin | ug/L | | 2.5 | U | 2.5 | U | | | P |
| Vanadium | ug/L | +/−5 | 8.06 | | 8.17 | | 1.36 | | P |
| Zinc | ug/L | | 3.3 | U | 3.3 | U | | | P |

***Analytical Methods:**

**P SW846 3005/6010B**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2698 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** CAPA−14−49424D

**Matrix:** WATER **Level:** Low

**Sample ID:** 339632006 **Duplicate ID:** 1203007991 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−20% | 32.8 | | 32.6 | | .557 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | | 15 | U | 15 | U | | | P |
| Calcium | ug/L | +/−20% | 13700 | | 13900 | | 1.33 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−20% | 4420 | | 4450 | | .767 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 1820 | | 1790 | | 1.73 | | P |
| Silica | ug/L | +/−20% | 69200 | | 70600 | | 2.02 | | P |
| Sodium | ug/L | +/−20% | 11000 | | 11100 | | .823 | | P |
| Strontium | ug/L | +/−20% | 60.2 | | 60.1 | | .183 | | P |
| Tin | ug/L | | 2.5 | U | 2.5 | U | | | P |
| Vanadium | ug/L | +/−5 | 4.52 | J | 4.74 | J | 4.81 | | P |
| Zinc | ug/L | | 3.3 | U | 3.37 | J | 200 | | P |

***Analytical Methods:**

**P SW846 3005/6010B**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2698 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** CAPA−14−49397D

**Matrix:** WATER **Level:** Low

**Sample ID:** 339487001 **Duplicate ID:** 1203013372 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2698

**Contract:** ESHL00210

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203007982 | | | | | | | | |
| | Antimony | ug/L | 50 | 52.1 | | 104 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 54.6 | | 109 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 53.5 | | 107 | 80−120 | MS |
| | Chromium | ug/L | 50 | 52.9 | | 106 | 80−120 | MS |
| | Lead | ug/L | 50 | 48.8 | | 97.7 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 48.6 | | 97.2 | 80−120 | MS |
| | Nickel | ug/L | 50 | 53.1 | | 106 | 80−120 | MS |
| | Selenium | ug/L | 50 | 54.4 | | 109 | 80−120 | MS |
| | Silver | ug/L | 50 | 52.1 | | 104 | 80−120 | MS |
| | Thallium | ug/L | 50 | 46.2 | | 92.4 | 80−120 | MS |
| | Uranium | ug/L | 50 | 49.8 | | 99.6 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2698

**Contract:** ESHL00210

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203007987 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 5340 | | 107 | 80−120 | P |
| | Barium | ug/L | 500 | 527 | | 105 | 80−120 | P |
| | Beryllium | ug/L | 500 | 526 | | 105 | 80−120 | P |
| | Boron | ug/L | 500 | 508 | | 102 | 80−120 | P |
| | Calcium | ug/L | 5000 | 5240 | | 105 | 80−120 | P |
| | Cobalt | ug/L | 500 | 515 | | 103 | 80−120 | P |
| | Copper | ug/L | 500 | 507 | | 101 | 80−120 | P |
| | Iron | ug/L | 5000 | 5410 | | 108 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 5540 | | 111 | 80−120 | P |
| | Manganese | ug/L | 500 | 506 | | 101 | 80−120 | P |
| | Potassium | ug/L | 5000 | 5200 | | 104 | 80−120 | P |
| | Silica | ug/L | 10700 | 10100 | | 94 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5350 | | 107 | 80−120 | P |
| | Strontium | ug/L | 500 | 532 | | 106 | 80−120 | P |
| | Tin | ug/L | 500 | 488 | | 97.6 | 80−120 | P |
| | Vanadium | ug/L | 500 | 500 | | 100 | 80−120 | P |
| | Zinc | ug/L | 500 | 494 | | 98.8 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2698

**Contract:** ESHL00210

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203013368 | | | | | | | | |
| | Mercury | ug/L | 2 | 2.07 | | 104 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2698 **Client ID** CAPA−14−49424L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 339632006 **Serial Dilution ID:** 1203007985

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 1.7 | U | 8.5 | U | | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 2 | U | 10 | U | | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | 1.77 | | 1.88 | J | 5.81 | | | MS |
| Nickel | .5 | U | 2.5 | U | | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | .658 | | .78 | J | 18.5 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2698 **Client ID** CALA−14−46054L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 339627002 **Serial Dilution ID:** 1203007990

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 49.6 | | 47.8 | | 3.65 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 27.4 | J | 75 | U | 100 | | | P |
| Calcium | 27900 | | 28300 | | 1.18 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 7860 | | 8260 | | 4.99 | | 10 | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 5270 | | 5380 | | 2.2 | | 10 | P |
| Silica | 45300 | | 43900 | | 3.22 | | 10 | P |
| Sodium | 18100 | | 19800 | | 9.45 | | 10 | P |
| Strontium | 139 | | 143 | | 2.59 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 8.06 | | 7.4 | J | 8.15 | | | P |
| Zinc | 3.3 | U | 16.5 | U | | | | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2698 **Client ID** CAPA−14−49424L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 339632006 **Serial Dilution ID:** 1203007993

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 32.8 | | 32.6 | | .462 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 15 | U | 75 | U | | | | P |
| Calcium | 13700 | | 13800 | | .477 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 4420 | | 4690 | | 6.22 | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 1820 | | 1910 | | 4.85 | | | P |
| Silica | 69200 | | 69500 | | .402 | | 10 | P |
| Sodium | 11000 | | 12200 | | 10.9 | E | 10 | P |
| Strontium | 60.2 | | 65.4 | | 8.62 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 4.52 | J | 5.68 | J | 25.7 | | | P |
| Zinc | 3.3 | U | 16.5 | U | | | | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2698 **Client ID** CAPA−14−49397L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 339487001 **Serial Dilution ID:** 1203013373

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 15-JAN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ICP | SW846 3005/6010B | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1355210 | See Below | | |

**Potentially affected work order(s)(SDG): 339625(2014-2697),339627(2014-2698),339631(2014-2699),339632(2014-2700)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203007989MS | 1. The matrix spike recovery failed outside of the control limits for sodium due to possible matrix interferences and/or non-homogeneity. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported. |

**Originator's Name:**

Helen Camello 15-JAN-14

**Data Validator/Group Leader:**

Theresa McKelvey 15-JAN-14

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International (ARSL)**
**SDG 2014-2698**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1355360 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 339627001 | CALA-14-46053 |
| 1203008306 | Method Blank (MB) |
| 1203008307 | 339421001(CAWR-13-42147) Sample Duplicate (DUP) |
| 1203008308 | 339632009(CAPA-14-49399) Sample Duplicate (DUP) |
| 1203008309 | 339421001(CAWR-13-42147) Post Spike (PS) |
| 1203008310 | 339632009(CAPA-14-49399) Post Spike (PS) |
| 1203008311 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 339421001 (CAWR-13-42147) and 339632009 (CAPA-14-49399).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
A 15 mg/L Total Inorganic Carbon check standard is analyzed with each analytical run to prove that the instrument is effectively sparging away the inorganic carbon.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1357259 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 339627002 | CALA-14-46054 |
| 1203013063 | Laboratory Control Sample (LCS) |
| 1203013064 | 339632006(CAPA-14-49424) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Conductivity analysis was performed on a Orion 160 Conductivity Meter.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339632006 (CAPA-14-49424).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1356320 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 339627002 | CALA-14-46054 |
| 1203010653 | 339493006(CAPA-14-49409) Sample Duplicate (DUP) |
| 1203010654 | 339497001(CAPA-14-49316) Sample Duplicate (DUP) |
| 1203010658 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Electrode analysis was performed on a PerpHect pH Meter Orion 370.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 339493006 (CAPA-14-49409) and 339497001 (CAPA-14-49316).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
The following samples from this sample group were received by the lab outside of the method specified holding time: 1203010653 (CAPA-14-49409), 1203010654 (CAPA-14-49316) and 339627002 (CALA-14-46054).

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1254916 1203010653 (CAPA-14-49409), 1203010654 (CAPA-14-49316) and 339627002 (CALA-14-46054).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1355464 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1355463 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 339627001 | CALA-14-46053 |
| 1203008537 | Method Blank (MB) |
| 1203008538 | 339627001(CALA-14-46053) Sample Duplicate (DUP) |
| 1203008539 | 339631001(CAPA-14-49376) Sample Duplicate (DUP) |
| 1203008540 | 339627001(CALA-14-46053) Matrix Spike (MS) |
| 1203008541 | 339631001(CAPA-14-49376) Matrix Spike (MS) |
| 1203008542 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 339627001 (CALA-14-46053) and 339631001 (CAPA-14-49376).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203008540 (CALA-14-46053).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203008542 (LCS).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1254517 1203008540 (CALA-14-46053).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1355133 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 339627002 | CALA-14-46054 |
| 1203007869 | Method Blank (MB) |
| 1203007870 | 339627002(CALA-14-46054) Sample Duplicate (DUP) |
| 1203007871 | 339627002(CALA-14-46054) Post Spike (PS) |
| 1203007872 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 22.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339627002 (CALA-14-46054).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203007870 (CALA-14-46054), 1203007871 (CALA-14-46054) and 339627002 (CALA-14-46054).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203007870 (CALA-14-46054), 1203007871 (CALA-14-46054) and 339627002 (CALA-14-46054).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1354977 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1354976 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 339627001 | CALA-14-46053 |
| 1203007484 | Method Blank (MB) |
| 1203007485 | Laboratory Control Sample (LCS) |
| 1203007487 | 339493001(CAPA-14-49383) Sample Duplicate (DUP) |
| 1203007488 | 339493001(CAPA-14-49383) Matrix Spike (MS) |
| 1203010120 | 339417012(CAPA-14-49390) Sample Duplicate (DUP) |
| 1203010121 | 339417012(CAPA-14-49390) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 339417012 (CAPA-14-49390) and 339493001 (CAPA-14-49383).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203007488 (CAPA-14-49383).

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203007487 (CAPA-14-49383) and 1203010120 (CAPA-14-49390).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1255420 1203007488 (CAPA-14-49383).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1355285 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 339627002 | CALA-14-46054 |
| 1203008158 | Method Blank (MB) |
| 1203008159 | 339625002(CAWR-13-42159) Sample Duplicate (DUP) |
| 1203008160 | 339632014(CAPA-14-49425) Sample Duplicate (DUP) |
| 1203008162 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 339625002 (CAWR-13-42159) and 339632014 (CAPA-14-49425).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203008160 (CAPA-14-49425).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1257739 1203008160 (CAPA-14-49425).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1356417 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 339627002 | CALA-14-46054 |
| 1203010873 | Method Blank (MB) |
| 1203010874 | Laboratory Control Sample (LCS) |
| 1203010875 | 339632006(CAPA-14-49424) Sample Duplicate (DUP) |
| 1203010876 | 339632006(CAPA-14-49424) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The method blank associated with this data was slightly above the normal acceptance limits. The data for sample was deemed acceptable because the values for all reported samples were more than 10 times the value of the PQL. 1203010873 (MB).

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339632006 (CAPA-14-49424).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1256033 1203010873 (MB).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____15Jan14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2698  GEL Work Order: 339627

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

H  Analytical holding time was exceeded

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 10, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2014-2698

Client Sample ID: CALA-14-46053
Sample ID: 339627001
Matrix: W
Collect Date: 17-DEC-13 09:45
Receive Date: 19-DEC-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 1.31 | 0.330 | 1.00 | mg/L | 1 | TSM | 12/31/13 | 0649 | 1355360 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | KLP1 | 12/23/13 | 1537 | 1355464 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.112 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 12/27/13 | 1408 | 1354977 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | MXV1 | 12/23/13 | 1515 | 1355463 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | MXV1 | 12/26/13 | 1700 | 1354976 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 10, 2014

| | |
|---|---|
| Company : | Los Alamos National Laboratory |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 |
| | Los Alamos, New Mexico 87545 |
| Contact: | Mr. Keith Greene |
| Project: | LANL-WQH Water Samples |

Client SDG: 2014-2698

| | | | |
|---|---|---|---|
| Client Sample ID: | CALA-14-46054 | Project: | ESHL00210 |
| Sample ID: | 339627002 | Client ID: | ARSL001 |
| Matrix: | W | | |
| Collect Date: | 17-DEC-13 09:45 | | |
| Receive Date: | 19-DEC-13 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conductivity Analysis | | | | | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 309 | 1.00 | 1.00 | umhos/cm | 1 | LXA1 | 01/02/14 | 1522 | 1357259 | 1 |
| Electrode Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 11.1C | H | 7.62 | 0.010 | 0.100 | SU | 1 | LYG1 | 12/26/13 | 0812 | 1356320 | 2 |
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | J | 0.159 | 0.067 | 0.200 | mg/L | 1 | DM | 12/31/13 | 0132 | 1355133 | 3 |
| Fluoride | | 0.486 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Chloride | | 17.5 | 0.335 | 1.00 | mg/L | 5 | DM | 12/31/13 | 1517 | 1355133 | 4 |
| Sulfate | | 21.7 | 0.665 | 2.00 | mg/L | 5 | | | | | |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 197 | 3.40 | 14.3 | mg/L | | LYG1 | 12/20/13 | 0715 | 1355285 | 5 |
| Titration Analysis | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 80.4 | 0.725 | 1.00 | mg/L | | LXA1 | 12/26/13 | 1705 | 1356417 | 6 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 120.1 | |
| 2 | EPA 150.1 | |
| 3 | EPA 300.0 | |
| 4 | EPA 300.0 | |
| 5 | EPA 160.1 | |
| 6 | EPA 310.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: January 10, 2014



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **339627**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | | |
| Batch 1355360 | | | | | | | | | | | | |
| QC1203008307 339421001 DUP | | | | | | | | | | | | |
| Total Organic Carbon Average | | | 4.37 | | 4.24 | mg/L | 3.04 | ^ | | (+/-1.00) | TSM | 12/31/13 03:15 |
| QC1203008308 339632009 DUP | | | | | | | | | | | | |
| Total Organic Carbon Average | | J | 0.709 | J | 0.781 | mg/L | 9.66 | ^ | | (+/-1.00) | | 12/31/13 09:04 |
| QC1203008311 LCS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 10.3 | mg/L | | | 103 | (85%-115%) | | 12/31/13 00:52 |
| QC1203008306 MB | | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | | 12/31/13 00:43 |
| QC1203008309 339421001 PS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | 4.37 | | 14.7 | mg/L | | | 103 | (65%-120%) | | 12/31/13 03:35 |
| QC1203008310 339632009 PS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | J | 0.709 | | 11.0 | mg/L | | | 103 | (65%-120%) | | 12/31/13 09:24 |
| **Conductivity Analysis** | | | | | | | | | | | | |
| Batch 1357259 | | | | | | | | | | | | |
| QC1203013064 339632006 DUP | | | | | | | | | | | | |
| Conductivity | | | 149 | | 152 | umhos/cm | 1.59 | | | (0%-10%) | LXA1 | 01/02/14 15:23 |
| QC1203013063 LCS | | | | | | | | | | | | |
| Conductivity | 1410 | | | | 1430 | umhos/cm | | | 101 | (95%-105%) | | 01/02/14 15:11 |
| **Electrode Analysis** | | | | | | | | | | | | |
| Batch 1356320 | | | | | | | | | | | | |
| QC1203010653 339493006 DUP | | | | | | | | | | | | |
| pH | | H | 7.92 | H | 7.93 | SU | 0.126 | | | (0%-10%) | LYG1 | 12/26/13 07:57 |
| QC1203010654 339497001 DUP | | | | | | | | | | | | |
| pH | | H | 6.18 | H | 6.24 | SU | 0.966 | | | (0%-10%) | | 12/26/13 08:04 |
| QC1203010658 LCS | | | | | | | | | | | | |
| pH | 7.00 | | | | 7.04 | SU | | | 101 | (99%-101%) | | 12/26/13 07:15 |
| **Flow Injection Analysis** | | | | | | | | | | | | |
| Batch 1355464 | | | | | | | | | | | | |
| QC1203008538 339627001 DUP | | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | | KLP1 | 12/23/13 15:40 |
| QC1203008539 339631001 DUP | | | | | | | | | | | | |

## QC Summary

**Workorder:** **339627**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Flow Injection Analysis** | | | | | | | | | | | |
| Batch 1355464 | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | | 12/23/13 15:42 |
| QC1203008542 LCS | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 52.5 | ug/L | | 105 | (90%-110%) | KLP1 | 12/23/13 15:35 |
| QC1203008537 MB | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | 12/23/13 15:29 |
| QC1203008540 339627001 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 75.5 | ug/L | | 75.5* | (90%-110%) | | 12/23/13 15:41 |
| QC1203008541 339631001 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 109 | ug/L | | 109 | (90%-110%) | | 12/23/13 15:43 |
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1355133 | | | | | | | | | | | |
| QC1203007870 339627002 DUP | | | | | | | | | | | |
| Bromide | | J | 0.159 | J | 0.143 | mg/L | 10.9 ^ | | (+/-0.200) | DM | 12/31/13 02:03 |
| Chloride | | | 17.5 | | 17.4 | mg/L | 0.367 | | (0%-20%) | | 12/31/13 15:49 |
| Fluoride | | | 0.486 | | 0.498 | mg/L | 2.58 ^ | | (+/-0.100) | | 12/31/13 02:03 |
| Sulfate | | | 21.7 | | 21.7 | mg/L | 0.184 | | (0%-20%) | | 12/31/13 15:49 |
| QC1203007872 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.28 | mg/L | | 103 | (90%-110%) | | 12/30/13 22:23 |
| Chloride | 5.00 | | | | 4.97 | mg/L | | 99.4 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.58 | mg/L | | 103 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 10.3 | mg/L | | 103 | (90%-110%) | | |
| QC1203007869 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 12/30/13 21:52 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203007871 339627002 PS | | | | | | | | | | | |
| Bromide | 1.25 | J | 0.159 | | 1.45 | mg/L | | 103 | (90%-110%) | | 12/31/13 02:34 |

## QC Summary

**Workorder:** **339627**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1355133 | | | | | | | | | | | |
| Chloride | 5.00 | | 3.50 | | 8.93 | mg/L | | 109 | (90%-110%) | | 12/31/13 16:20 |
| Fluoride | 2.50 | | 0.486 | | 3.02 | mg/L | | 101 | (90%-110%) | DM | 12/31/13 02:34 |
| Sulfate | 10.0 | | 4.33 | | 15.0 | mg/L | | 107 | (90%-110%) | | 12/31/13 16:20 |
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1354977 | | | | | | | | | | | |
| QC1203007487 339493001 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | | KLP1 | 12/27/13 14:05 |
| QC1203010120 339417012 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | | | 12/27/13 13:55 |
| QC1203007485 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 1.07 | mg/L | | 107 | (90%-110%) | | 12/27/13 13:52 |
| QC1203007484 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | U | ND | mg/L | | | | | 12/27/13 13:51 |
| QC1203007488 339493001 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 0.887 | mg/L | | 88.7* | (90%-110%) | | 12/27/13 14:06 |
| QC1203010121 339417012 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 0.934 | mg/L | | 93.4 | (90%-110%) | | 12/27/13 13:56 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1355285 | | | | | | | | | | | |
| QC1203008159 339625002 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 187 | | 187 | mg/L | 0.00 | | (0%-10%) | LYG1 | 12/20/13 07:15 |
| QC1203008160 339632014 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 140 | | 119 | mg/L | 16.6* | | (0%-10%) | | 12/20/13 07:15 |
| QC1203008162 LCS | | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | | 293 | mg/L | | 97.6 | (95%-105%) | | 12/20/13 07:15 |
| QC1203008158 MB | | | | | | | | | | | |
| Total Dissolved Solids | | | | U | ND | mg/L | | | | | 12/20/13 07:15 |
| **Titration Analysis** | | | | | | | | | | | |
| Batch 1356417 | | | | | | | | | | | |
| QC1203010875 339632006 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | | | 64.0 | mg/L | N/A | | (0%-20%) | LXA1 | 12/26/13 17:31 |
| Carbonate alkalinity (CaCO3) | | | | U | ND | mg/L | N/A | | (+/-1.00) | | |

## QC Summary

**Workorder:** **339627**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Titration Analysis** | | | | | | | | | | | |
| Batch 1356417 | | | | | | | | | | | |
| QC1203010874 LCS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | 51.8 | mg/L | | 104 | (90%-110%) | LXA1 | 12/26/13 | 16:07 |
| QC1203010873 MB | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | | 2.12 | mg/L | | | | | 12/26/13 | 16:05 |
| Carbonate alkalinity (CaCO3) | | | U | ND | mg/L | | | | | | |
| QC1203010876 339632006 MS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | 115 | mg/L | | 103 | (80%-120%) | | 12/26/13 | 17:38 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

## QC Summary

**Workorder:** **339627**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 23-DEC-13 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 335.4 | Liquid | ARSL, CARE, VCSU |
| **Batch ID:** | **Sample Numbers:** | | |
| 1355464 | See Below | | |

**Potentially affected work order(s)(SDG):** **339212,339441,339452,339535,339627(2014-2698),339631(2014-2699),339632(2014-2700),339720(2014-2709),339721(2014-2715),339790(13125816),339818(EUI-9499),339826(EUI-9503)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Sample received out of holding

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/MSD:<br><br>QC 1203008540MS, 1203009926MS, 1203009927MSD<br><br>2. Failed RPD for MS/MSD, or PS/PSD:<br><br>QC 1203009927MSD<br><br>3. Samples received out of holding:<br><br>339212 001, 002, 003 | 1. The spike and spike duplicate recovery falls outside of the established acceptance limits due to matrix interference:<br>1203009926 and 1203009927<br><br>The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.<br>1203008540<br><br>2. The Relative Percent Difference (RPD) between the spike and spike duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample.<br><br>3. The samples were received by the lab outside of the method specified holding time. |

**Originator's Name:**

Kristen Parson 23-DEC-13

**Data Validator/Group Leader:**

Thomas Lewis 23-DEC-13

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 26-DEC-13 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ELECTRODE | See Below | Liquid | BETT, CARE, ESHL, GELC, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1356320 | See Below | | |

**Potentially affected work order(s)(SDG):** **339047,339294,339336(EUI-9493),339377,339420,339493(2014-2693),339497(2014-2694),339542,339625(2014-2697),339627(2014-2698),339631(2014-2699),339632(2014-2700),339720(2014-2709),339820**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| Test/Methods: EPA 150.1, SM 4500-H B, SW846 9040B/9040C, SW846 9040C<br><br>1. Sample received out of holding:<br><br>339047 002,006,010<br>339294 004,007,010<br>339336 002<br>339377 001,002<br>339420 001<br>339493 006<br>339497 001<br>339542 001<br>339625 002<br>339627 002<br>339631 006<br>339632 006,014<br>339720 003<br>339820 004 | 1. Sample received out of holding |

**Originator's Name:**

Lisa Gregory 26-DEC-13

**Data Validator/Group Leader:**

Elzbieta Szulc 30-DEC-13

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 27-DEC-13 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 351.2 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1354977 | See Below | | |

**Potentially affected work order(s)(SDG):** **339417(2014-2682),339421(2014-2681),339487(2014-2692),339493(2014-2693),339625(2014-2697),339627(2014-2698),339631(2014-2699),339632(2014-2700),339720(2014-2709),339721(2014-2715)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS:<br><br>QC 1203007488MS | 1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. |

**Originator's Name:**

Kristen Parson 27-DEC-13

**Data Validator/Group Leader:**

Elzbieta Szulc 10-JAN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 31-DEC-13 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| BURET | EPA 310.1, SM 2320B | Liquid | ESHL, HNLK, NAIR |
| **Batch ID:** | **Sample Numbers:** | | |
| 1356417 | See Below | | |

**Potentially affected work order(s)(SDG): 339542,339604,339625(2014-2697),339627(2014-2698),339631(2014-2699),339632(2014-2700)**

**Application Issues:**

Method Blank contamination

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Method Blank contamination:<br><br>QC 1203010873MB | 1. The MB result was higher than the PQL. As all sample results were over 10x the PQL, the data is reported. |

**Originator's Name:**

Lindsey Jensen 31-DEC-13

**Data Validator/Group Leader:**

Elzbieta Szulc 31-DEC-13

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 07-JAN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| BALANCE | EPA 160.1, SM 2540C | Liquid | ESHL, UCOR, VCSU |
| **Batch ID:** | **Sample Numbers:** | | |
| 1355285 | See Below | | |

**Potentially affected work order(s)(SDG): 339212,339625(2014-2697),339627(2014-2698),339631(2014-2699),339632(2014-2700),339676**

**Application Issues:**

Sample received out of holding

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203008160DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |
| 2. Samples received out of holding:<br><br>339212 001,002,003 | 2. The following samples from this sample group were received by the lab outside of the method specified holding time. |

**Originator's Name:**

Lisa Gregory 07-JAN-14

**Data Validator/Group Leader:**

Elzbieta Szulc 08-JAN-14

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2014-3574



**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8081A-HCB | WSP-LL-8151A-PCP | WSP-LL-8260B | WSP-LL-8270C | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | | | Special Instructions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-79458 | Jun 17 2014 | 11:04 | W | 1 | 2 | 3 | 2 | 3 | 2 | 3 | | 1 | | 1 | 2 | 2 | 2 | 1 | | 1 | 1 | | | |
| CALA-14-79464 | Jun 17 2014 | 11:04 | W | | | | | | | | 1 | | 1 | | | | | | 1 | | | | | |
| CALA-14-79446 | Jun 17 2014 | 11:04 | W | | 2 | 3 | 2 | 3 | 2 | | | | | | 2 | 2 | 2 | 1 | | | | | | |
| CALA-14-79447 | Jun 17 2014 | 11:04 | W | 1 | 2 | 3 | 2 | 3 | 2 | 3 | | 1 | | 1 | 2 | 2 | 2 | 1 | | 1 | 1 | | | |
| CALA-14-79448 | Jun 17 2014 | 11:04 | W | | | | | | | | 1 | | 1 | | | | | | 1 | | | | | |
| CALA-14-79451 | Jun 17 2014 | 11:04 | W | | 2 | | 2 | | | | | | | | | | | | | | | | | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 6/18/14 3:40 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79446

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 6/17/2014 | **FIELD MATRIX:** | WG | OK |
| **TIME COLLECTED (HH:MM):** | | 1604 | **MEDIA:** | UA | ✓ |
| **PRS ID:** | | OK | **SAMPLE TECH CODE:** | UA | OK |
| **LOCATION ID:** | LLAO-4 | ✓ | **FIELD PREP:** | UF | OK |
| **LOCATION TYPE:** | | ✓ | **FIELD QC TYPE:** | FB | ✓ |
| **PORT:** | SINGLE COMPLETION | ✓ | **SAMPLE USAGE:** | QC | ✓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ✓ | NA |
| ✓ | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 6/17/14 | ✓ | ✓ |
| ✓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ✓ | ✓ |
| ✓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 6/17/14 | ✓ | ✓ |
| ✓ | WSP-8310-PAH | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE MS 6/17/14 | ✓ | ✓ |
| ✓ | WSP-LL-8081A-HCB | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE MS 6/17/14 | ✓ | ✓ |
| ✓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE MS 6/17/14 | ✓ | ✓ |
| ✓ | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ✓ | ✓ |
| ✓ | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | ✓ | ✓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79446

**WORK ORDER:**

**SAMPLE COMMENTS:** DI water from TA-54 lab 18.2 MΩ-cm

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation/Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Shaw

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| W Shaw | 6/17/14 1245 | Shepinwood | 6/17/14 1245 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 05/30/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79447

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 6/17/2014 | **FIELD MATRIX:** | WG | OK |
| **TIME COLLECTED (HH:MM):** | | 1104 | **MEDIA:** | UA | ✓ |
| **PRS ID:** | | OK | **SAMPLE TECH CODE:** | UA | BP |
| **LOCATION ID:** | LLAO-4 | ✓ | **FIELD PREP:** | UF | OK |
| **LOCATION TYPE:** | | ✓ | **FIELD QC TYPE:** | FD | ✓ |
| **PORT:** | SINGLE COMPLETION | ✓ | **SAMPLE USAGE:** | QC | ✓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | X | N/A |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 6/17/14 | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 6/17/14 | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE WS 6/17/14 | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 6/17/14 | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8081A-HCB | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE WS 6/17/14 | ✓ | ✓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79447

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE WS 6/17/14 | Y | N/A |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE WS 6/17/14 | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

N/A William Shan 6/17/2014

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) 6 GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** M Shando

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| William Shan | 6/17/14 1245 | Sherri Sherwood | 6/17/14 1245 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 05/30/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79448

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 6/17/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1104 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | BP |
| LOCATION ID: | LLAO-4 | | FIELD PREP: | F | OK |
| LOCATION TYPE: | | | FIELD QC TYPE: | FD | |
| PORT: | SINGLE COMPLETION | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | N/A |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** M Shaw

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) William Shaw<br>(Signature) | 6/17/14 1245 | (Printed Name) S. Sherwood<br>(Signature) Sheri Sherwood | 6/17/14 1245 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 05/30/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79451

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 6/17/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | OK | MEDIA: | UA | |
| PRS ID: | | | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | LLAO-4 | | FIELD PREP: | UF | OK |
| LOCATION TYPE: | | | FIELD QC TYPE: | FTB | |
| PORT: | SINGLE COMPLETION | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 1 | ~~Na2S2O3~~ HCL ns 6/17/14 | Y | N/A |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 1 | HCL | | |
| | ~~WSP-LL-8260B~~ | 40 ML SEPTUM AMBER GLASS | 2 | HCL | 6/17/2014 | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:** N/A William Shan 6/17/14

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** M Shando

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| William Shan | 6/17/14 1245 | D. Sherwood | 6/17/14 1245 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 05/30/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79458

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 6/17/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1104 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | BP |
| LOCATION ID: | LLAO-4 | | FIELD PREP: | UF | OK |
| LOCATION TYPE: | MON | | FIELD QC TYPE: | REG | |
| PORT: | SINGLE COMPLETION | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| Mt | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | X | Mt |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~3~~ 2 | ICE DF 6/17/14 | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~3~~ 2 | ICE DF 6/17/14 | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS | ~~3~~ 2 | ICE DF 6/17/14 | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8081A-HCB | 1 LITER AMBER GLASS | 2 | ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79458

**WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | Y | N/A |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:** very windy & Dust in air while sampling

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 1.34 mg/L Flow (in gpm) 0.24 GPM Oxidation-Reduction Potential 70.0 mV

pH 6.67 SU Specific Conductance 572 uS/cm Temperature 13.76 deg C

Turbidity 0.3 NTU

**COLLECTED BY (PRINT)** M Shendo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| William Shaw | 6/17/2014 1245 | S. Sherwood Sheri Sherwood | 6/17/14 1245 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date 05/30/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702 **EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79464 **WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 6/17/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1104 | MEDIA: | UA | |
| PRS ID: | | 016 | SAMPLE TECH CODE: | UA | BP |
| LOCATION ID: | LLAO-4 | | FIELD PREP: | F | OK |
| LOCATION TYPE: | MON | | FIELD QC TYPE: | REG | |
| PORT: | SINGLE COMPLETION | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | N/A |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:** William Shaw 6/17/2014

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** M. Shendo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| William Shaw | 6/17/14 1245 | B. Sherwood | 6/17/14 1245 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 05/30/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-3574

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 350951 | EPA:120.1 | 1 | 1 | | | |
| 350951 | EPA:150.1 | 1 | 1 | | | |
| 350951 | EPA:160.1 | 1 | 1 | | | |
| 350951 | EPA:245.2 | 2 | 2 | | | |
| 350951 | EPA:300.0 | 1 | 1 | | | |
| 350951 | EPA:310.1 | 1 | 1 | | | |
| 350951 | EPA:335.4 | 1 | 1 | | | |
| 350951 | EPA:350.1 | 1 | 1 | | | |
| 350951 | EPA:351.2 | 1 | 1 | | | |
| 350951 | EPA:353.2 | 1 | 1 | | | |
| 350951 | EPA:365.4 | 1 | 1 | | | |
| 350951 | EPA:900 | 1 | 1 | | | |
| 350951 | EPA:901.1 | 1 | 1 | | | |
| 350951 | EPA:905.0 | 1 | 1 | | | |
| 350951 | HASL-300:AM-241 | 1 | 1 | | | |
| 350951 | HASL-300:ISOPU | 1 | 1 | | | |
| 350951 | HASL-300:ISOU | 1 | 1 | | | |
| 350951 | SM:A2340B | 1 | 1 | | | |
| 350951 | SW-846:6010C | 1 | 1 | | | |
| 350951 | SW-846:6020 | 1 | 1 | | | |
| 350951 | SW-846:6850 | 1 | 1 | | | |
| 350951 | SW-846:8011 | 1 | 1 | 1 | 1 | |
| 350951 | SW-846:8081B | 1 | 1 | | 1 | |
| 350951 | SW-846:8082 | 1 | 1 | | 1 | |
| 350951 | SW-846:8151A | 1 | 1 | | 1 | |
| 350951 | SW-846:8260B | 1 | 1 | 1 | 1 | |
| 350951 | SW-846:8270D | 1 | 1 | | 1 | |
| 350951 | SW-846:8310 | 1 | 1 | | 1 | |
| 350951 | SW-846:8321A_MOD | 1 | 1 | | | |
| 350951 | SW-846:9060 | 1 | 1 | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 350951 | EPA:120.1 | 1400986 | 1400986 | 1 | 1 | | | | | | | | | 1 | | | | 1 | | | |
| 350951 | EPA:150.1 | 1400108 | 1400108 | 1 | 1 | | | | | | | | | 1 | | | | 1 | | | |
| 350951 | EPA:160.1 | 1398055 | 1398055 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | EPA:245.2 | 1398324 | 1398323 | 2 | 2 | | | | 1 | | | | | 1 | | | | 2 | | | |
| 350951 | EPA:300.0 | 1397348 | 1397348 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | EPA:310.1 | 1399451 | 1399451 | 1 | 1 | | | | 2 | | | | | 2 | | | | 1 | | | |
| 350951 | EPA:335.4 | 1397084 | 1397082 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | EPA:350.1 | 1397518 | 1397517 | 1 | 1 | | | | 1 | | | | | 1 | | | | 2 | | | |
| 350951 | EPA:351.2 | 1397514 | 1397513 | 1 | 1 | | | | 1 | | | | | 1 | | | | 2 | | | |
| 350951 | EPA:353.2 | 1397522 | 1397522 | 1 | 1 | | | | 1 | | | | | 1 | | | | 2 | | | |
| 350951 | EPA:365.4 | 1397516 | 1397515 | 1 | 1 | | | | 1 | | | | | 1 | | | | 3 | | | |
| 350951 | EPA:900 | 1399669 | 1399669 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | EPA:901.1 | 1397133 | 1397133 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | EPA:905.0 | 1399646 | 1399646 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | HASL-300:AM-241 | 1398720 | 1398720 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | HASL-300:ISOPU | 1398721 | 1398721 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | HASL-300:ISOU | 1397164 | 1397164 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | SM:A2340B | 1404141 | 1404141 | 1 | 1 | | | | | | | | | | | | | | | | |
| 350951 | SW-846:6010C | 1397305 | 1397304 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | SW-846:6020 | 1397300 | 1397299 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 350951 | SW-846:6850 | 1397916 | 1397915 | 1 | 1 | | | | 1 | | | | | 1 | | | | | | | |
| 350951 | SW-846:8011 | 1397233 | 1397232 | 1 | 1 | 1 | 1 | | 1 | | | | | 1 | 1 | | | | | | |
| 350951 | SW-846:8081B | 1398217 | 1398216 | 1 | 1 | | 1 | | 1 | | | | | 1 | 1 | | | | | | |
| 350951 | SW-846:8082 | 1397329 | 1397328 | 1 | 1 | | 1 | | 1 | | | | | 1 | | | | | | | |
| 350951 | SW-846:8151A | 1397789 | 1397787 | 1 | 1 | | 1 | | 1 | | | | | 1 | 1 | | | | | | |
| 350951 | SW-846:8260B | 1399998 | 1399998 | 1 | 1 | 1 | 1 | | 1 | | | | | 2 | | | | | | | |
| 350951 | SW-846:8270D | 1398264 | 1398263 | 1 | 1 | | 1 | | 1 | | | | | 1 | | | | | | | |
| 350951 | SW-846:8310 | 1398214 | 1398212 | 1 | 1 | | 1 | | 1 | | | | | 1 | | | | | | | |
| 350951 | SW-846:8321A_MOD | 1397441 | 1397439 | 1 | 1 | | | | 1 | | | | | 1 | | | | | | | |
| 350951 | SW-846:9060 | 1397532 | 1397532 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |

# DATA VALIDATION REPORT

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CALA-14-79466 | 1203121764 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203121763 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CALA-14-79464 | 1203119756 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203119758 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CALA-14-79464 | 1203114532 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203114536 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203114531 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-79447 | 350951019 | FD | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-79458 | 350951005 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-79460 | 1203115080 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203115079 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203115078 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | WTRON-14-79963 | 1203115083 | DUP | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CALA-14-79448 | 350951022 | FD | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CALA-14-79464 | 1203112700 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CALA-14-79464 | 350951008 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203112702 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203112699 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CALA-14-79448 | 350951022 | FD | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CALA-14-79464 | 1203117907 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CALA-14-79464 | 350951008 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203117915 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203117916 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203117903 | MB | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203117904 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CALA-14-79447 | 350951019 | FD | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CALA-14-79458 | 1203113067 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CALA-14-79458 | 350951005 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203112039 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203112036 | MB | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:350.1 | GENERAL CHEMISTRY | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CALA-14-79464 | 1203113116 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203113123 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203113114 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | WST03-14-67206 | 1203113115 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CALA-14-79447 | 350951019 | FD | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CALA-14-79458 | 1203113094 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CALA-14-79458 | 350951005 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203113101 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203113090 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | VS-R28-V2-79984 | 1203113091 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CALA-14-79464 | 1203113137 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203113141 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203113134 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | WST03-14-67206 | 1203113135 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CALA-14-79464 | 1203113106 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203113113 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203113102 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | VS-R28-V2-79984 | 1203113103 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | WST03-14-67206 | 1203113104 | DUP | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | CALA-14-79447 | 350951019 | FD | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CALA-14-79458 | 350951005 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CALA-14-79747 | 1203118573 | DUP | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | LCS | 1203118576 | LCS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | MB | 1203118572 | MB | 2 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CALA-14-79447 | 350951019 | FD | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CALA-14-79458 | 1203112194 | DUP | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CALA-14-79458 | 350951005 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | LCS | 1203112195 | LCS | 0 | 0 | 3 | 0 |
| EPA:901.1 | RAD | MB | 1203112193 | MB | 5 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CALA-14-79447 | 350951019 | FD | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CALA-14-79458 | 350951005 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CALA-14-79747 | 1203118496 | DUP | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | LCS | 1203118498 | LCS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | MB | 1203118495 | MB | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| HASL-300:AM-241 | RAD | CALA-14-79447 | 350951019 | FD | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CALA-14-79458 | 350951005 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CALA-14-79460 | 1203116112 | DUP | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | LCS | 1203116113 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:AM-241 | RAD | MB | 1203116111 | MB | 1 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CALA-14-79447 | 350951019 | FD | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CALA-14-79458 | 350951005 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CALA-14-79460 | 1203116115 | DUP | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | LCS | 1203116116 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOPU | RAD | MB | 1203116114 | MB | 2 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CALA-14-79447 | 350951019 | FD | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CALA-14-79458 | 1203112269 | DUP | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CALA-14-79458 | 350951005 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | LCS | 1203112270 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOU | RAD | MB | 1203112268 | MB | 3 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CALA-14-79448 | 350951022 | FD | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CALA-14-79464 | 1203112573 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CALA-14-79464 | 350951008 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203112572 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203112571 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CALA-14-79448 | 350951022 | FD | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CALA-14-79464 | 1203112563 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CALA-14-79464 | 350951008 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203112562 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203112561 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CALA-14-79448 | 350951022 | FD | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CALA-14-79464 | 350951008 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203114150 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203114149 | MB | 1 | 0 | 0 | 0 |
| SW-846:8011 | VOC | CALA-14-79446 | 350951009 | FB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CALA-14-79447 | 350951015 | FD | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CALA-14-79451 | 350951023 | FTB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CALA-14-79458 | 350951001 | REG | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | LCS | 1203112400 | LCS | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | LCSD | 1203112401 | LCSD | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | MB | 1203112399 | MB | 2 | 1 | 0 | 0 |
| SW-846:8081B | PESTPCB | CALA-14-79446 | 350951012 | FB | 1 | 2 | 0 | 0 |
| SW-846:8081B | PESTPCB | CALA-14-79447 | 350951020 | FD | 1 | 2 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8081B | PESTPCB | CALA-14-79458 | 350951006 | REG | 1 | 2 | 0 | 0 |
| SW-846:8081B | PESTPCB | LCS | 1203114815 | LCS | 0 | 2 | 1 | 0 |
| SW-846:8081B | PESTPCB | LCSD | 1203114818 | LCSD | 0 | 2 | 1 | 0 |
| SW-846:8081B | PESTPCB | MB | 1203114814 | MB | 1 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CALA-14-79446 | 350951010 | FB | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CALA-14-79447 | 350951016 | FD | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CALA-14-79458 | 350951002 | REG | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | LCS | 1203112640 | LCS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | MB | 1203112639 | MB | 8 | 2 | 0 | 0 |
| SW-846:8151A | HERB | CALA-14-79446 | 350951013 | FB | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | CALA-14-79447 | 350951021 | FD | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | CALA-14-79458 | 350951007 | REG | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | LCS | 1203113794 | LCS | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | LCSD | 1203113795 | LCSD | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | MB | 1203113792 | MB | 1 | 1 | 0 | 0 |
| SW-846:8260B | VOC | CALA-14-79446 | 350951014 | FB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CALA-14-79447 | 350951019 | FD | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CALA-14-79451 | 350951024 | FTB | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CALA-14-79458 | 350951005 | REG | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | LCS | 1203119466 | LCS | 0 | 3 | 70 | 0 |
| SW-846:8260B | VOC | LCS | 1203119467 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203119463 | MB | 80 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | CALA-14-79446 | 350951014 | FB | 60 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CALA-14-79447 | 350951019 | FD | 60 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CALA-14-79458 | 350951005 | REG | 60 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | LCS | 1203114924 | LCS | 0 | 6 | 56 | 0 |
| SW-846:8270D | SVOC | MB | 1203114923 | MB | 60 | 6 | 0 | 0 |
| SW-846:8310 | SVOC | CALA-14-79446 | 350951011 | FB | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | CALA-14-79447 | 350951017 | FD | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | CALA-14-79458 | 350951003 | REG | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | LCS | 1203114811 | LCS | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | MB | 1203114810 | MB | 18 | 1 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | CALA-14-79447 | 350951018 | FD | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | CALA-14-79458 | 350951004 | REG | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | LCS | 1203112897 | LCS | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | MB | 1203112896 | MB | 20 | 2 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CALA-14-79447 | 350951019 | FD | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CALA-14-79458 | 1203113155 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CALA-14-79458 | 350951005 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203113159 | LCS | 0 | 0 | 1 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203113154 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203112571 | METHOD BLANK | SW-846:6010C | W | Sodium | 116 | J | ug/L | 300 |
| MB | 1203113090 | METHOD BLANK | EPA:351.2 | W | Total Kjeldahl Nitrogen | 0.0414 | J | mg/L | 0.100 |
| MB | 1203113134 | METHOD BLANK | EPA:353.2 | W | Nitrate-Nitrite as Nitrogen | 0.0281 | J | mg/L | 0.050 |

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-79447 | 1203113090 | METHOD BLANK | EPA:351.2 | Total Kjeldahl Nitrogen | 0.0414 | mg/L | 0.184 | | 0.100 | Y | 5 | 100 | Y |
| CALA-14-79464 | 1203113134 | METHOD BLANK | EPA:353.2 | Nitrate-Nitrite as Nitrogen | 0.0281 | mg/L | 0.496 | | 0.050 | Y | 5 | 100 | Y |
| CALA-14-79448 | 1203113134 | METHOD BLANK | EPA:353.2 | Nitrate-Nitrite as Nitrogen | 0.0281 | mg/L | 0.054 | | 0.050 | Y | 5 | 100 | Y |

6. Any surrogate recoveries outside the control limits?

# DATA VALIDATION REPORT

| Field Sample ID | Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Spike Recovery | Upper Limit | Lower Limit | Rejection Limit |
|---|---|---|---|---|---|---|---|---|---|
| CALA-14-79451 | 350951023 | SW-846:8011 | Bromofluorobenzene[4-] | 1397233 | 06-23-2014 | 1756 | 135 | 73 | 10 |

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203119466 | | SW-846:8260B | Methylene Chloride | 1399998 | 07-01-2014 | W | 67 | | 120 | 75 | | 10 | | |
| 1203119467 | | SW-846:8260B | Chloro-1-propene[3-] | 1399998 | 07-01-2014 | W | 65 | | 127 | 67 | | 10 | | |
| 1203114924 | | SW-846:8270D | Nitrophenol[4-] | 1398263 | 06-25-2014 | W | 15 | | 77 | 16 | | | | |
| 1203114924 | | SW-846:8270D | Tetrachlorobenzene[1,2,4,5] | 1398263 | 06-25-2014 | W | 34 | | 95 | 36 | | | | |
| 1203112897 | | SW-846:8321A_MOD | Tetryl | 1397439 | 07-15-2014 | W | 42 | | 120 | 65 | | 10 | | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

# DATA VALIDATION REPORT

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLAO-4 | 2014-3574 | CALA-14-79446 | FB | INIT | VOC | SW-846:8260B | Chloro-1-propene[3-] | U | UJ | V12a | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 06/17/2014 | | 1399998 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79446 | FB | INIT | VOC | SW-846:8260B | Methylene Chloride | U | UJ | V12a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 06/17/2014 | | 1399998 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79446 | FB | INIT | SVOC | SW-846:8270D | Nitrophenol[4-] | U | UJ | SV12a | N | 11.0 | ug/L | 11.0 | ug/L | | | W | 06/17/2014 | | 1398264 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79446 | FB | INIT | SVOC | SW-846:8270D | Tetrachlorobenzene[1,2,4,5] | U | UJ | SV12a | N | 11.0 | ug/L | 11.0 | ug/L | | | W | 06/17/2014 | | 1398264 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | .00907 | pCi/L | .00907 | pCi/L | 0.0478 | 0.013 | W | 06/17/2014 | | 1398720 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | -.482 | pCi/L | -.482 | pCi/L | 5.16 | 1.56 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | VOC | SW-846:8260B | Chloro-1-propene[3-] | U | UJ | V12a | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 06/17/2014 | | 1399998 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | -1.45 | pCi/L | -1.45 | pCi/L | 5.40 | 1.51 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | -.219 | pCi/L | -.219 | pCi/L | 2.25 | 0.633 | W | 06/17/2014 | | 1399669 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | VOC | SW-846:8260B | Methylene Chloride | U | UJ | V12a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 06/17/2014 | | 1399998 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | .93 | pCi/L | .93 | pCi/L | 10.2 | 2.77 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | SVOC | SW-846:8270D | Nitrophenol[4-] | U | UJ | SV12a | N | 10.9 | ug/L | 10.9 | ug/L | | | W | 06/17/2014 | | 1398264 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | -.00229 | pCi/L | -.00229 | pCi/L | 0.0236 | 0.00397 | W | 06/17/2014 | | 1398721 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | .0137 | pCi/L | .0137 | pCi/L | 0.045 | 0.00793 | W | 06/17/2014 | | 1398721 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | -9.74 | pCi/L | -9.74 | pCi/L | 58.5 | 14.5 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | -3.41 | pCi/L | -3.41 | pCi/L | 3.81 | 1.40 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | .0948 | pCi/L | .0948 | pCi/L | 0.397 | 0.113 | W | 06/17/2014 | | 1399646 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | SVOC | SW-846:8270D | Tetrachlorobenzene[1,2,4,5] | U | UJ | SV12a | N | 10.9 | ug/L | 10.9 | ug/L | | | W | 06/17/2014 | | 1398264 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Tetryl | U | UJ | HE12a | N | 0.529 | ug/L | 0.529 | ug/L | | | W | 06/17/2014 | | 1397441 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | | U | I4 | N | 0.184 | mg/L | 0.184 | mg/L | | | W | 06/17/2014 | | 1397514 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79447 | FD | INIT | RAD | HASL-300:ISOU | Uranium-235/236 | U | U | R5 | N | .0334 | pCi/L | .0334 | pCi/L | 0.0586 | 0.0125 | W | 06/17/2014 | | 1397164 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79448 | FD | INIT | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | | U | I4 | N | 0.054 | mg/L | 0.054 | mg/L | | | W | 06/17/2014 | | 1397522 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79451 | FTB | INIT | VOC | SW-846:8260B | Chloro-1-propene[3-] | U | UJ | V12a | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 06/17/2014 | | 1399998 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79451 | FTB | INIT | VOC | SW-846:8260B | Methylene Chloride | U | UJ | V12a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 06/17/2014 | | 1399998 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | .00315 | pCi/L | .00315 | pCi/L | 0.0418 | 0.00577 | W | 06/17/2014 | | 1398720 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | -1.07 | pCi/L | -1.07 | pCi/L | 4.29 | 1.27 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | VOC | SW-846:8260B | Chloro-1-propene[3-] | U | UJ | V12a | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 06/17/2014 | | 1399998 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | .184 | pCi/L | .184 | pCi/L | 4.98 | 1.38 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | .213 | pCi/L | .213 | pCi/L | 1.95 | 0.559 | W | 06/17/2014 | | 1399669 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | EPA:900 | Gross beta | U | U | R5 | N | 1.15 | pCi/L | 1.15 | pCi/L | 1.79 | 0.556 | W | 06/17/2014 | | 1399669 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | VOC | SW-846:8260B | Methylene Chloride | U | UJ | V12a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 06/17/2014 | | 1399998 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | 2.55 | pCi/L | 2.55 | pCi/L | 10.3 | 2.78 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | SVOC | SW-846:8270D | Nitrophenol[4-] | U | UJ | SV12a | N | 10.4 | ug/L | 10.4 | ug/L | | | W | 06/17/2014 | | 1398264 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | -.00518 | pCi/L | -.00518 | pCi/L | 0.0268 | 0.00518 | W | 06/17/2014 | | 1398721 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | .0104 | pCi/L | .0104 | pCi/L | 0.051 | 0.00733 | W | 06/17/2014 | | 1398721 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | -1.52 | pCi/L | -1.52 | pCi/L | 69.4 | 17.4 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | -1.45 | pCi/L | -1.45 | pCi/L | 3.46 | 1.05 | W | 06/17/2014 | | 1397133 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | .123 | pCi/L | .123 | pCi/L | 0.387 | 0.112 | W | 06/17/2014 | | 1399646 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | SVOC | SW-846:8270D | Tetrachlorobenzene[1,2,4,5] | U | UJ | SV12a | N | 10.4 | ug/L | 10.4 | ug/L | | | W | 06/17/2014 | | 1398264 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Tetryl | U | UJ | HE12a | N | 0.571 | ug/L | 0.571 | ug/L | | | W | 06/17/2014 | | 1397441 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79458 | REG | INIT | RAD | HASL-300:ISOU | Uranium-235/236 | U | U | R5 | N | .045 | pCi/L | .045 | pCi/L | 0.0526 | 0.0131 | W | 06/17/2014 | | 1397164 | VAL | Y |
| LLAO-4 | 2014-3574 | CALA-14-79464 | REG | INIT | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | | J | I4a | Y | 0.496 | mg/L | 0.496 | mg/L | | | W | 06/17/2014 | | 1397522 | VAL | Y |

| Reason Code | Description |
|---|---|
| HE12a | The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits. |
| I4 | the sample result is =<5x the concentration of related analyte in the method blank. |
| I4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x |
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| R5 | Analyte is not detected because the amount reported is less than the MDC. |
| SV12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |
| V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. |

# DATA VALIDATION REPORT

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CALA-14-79446 | LLAO-4 | FB | SW-846:8011 | 0 | 2 |
| CALA-14-79446 | LLAO-4 | FB | SW-846:8081B | 0 | 1 |
| CALA-14-79446 | LLAO-4 | FB | SW-846:8082 | 0 | 8 |
| CALA-14-79446 | LLAO-4 | FB | SW-846:8151A | 0 | 1 |
| CALA-14-79446 | LLAO-4 | FB | SW-846:8260B | 0 | 78 |
| CALA-14-79446 | LLAO-4 | FB | SW-846:8270D | 0 | 60 |
| CALA-14-79446 | LLAO-4 | FB | SW-846:8310 | 0 | 18 |
| CALA-14-79447 | LLAO-4 | FD | EPA:245.2 | 0 | 1 |
| CALA-14-79447 | LLAO-4 | FD | EPA:335.4 | 0 | 1 |
| CALA-14-79447 | LLAO-4 | FD | EPA:351.2 | 0 | 1 |
| CALA-14-79447 | LLAO-4 | FD | EPA:900 | 0 | 2 |
| CALA-14-79447 | LLAO-4 | FD | EPA:901.1 | 0 | 5 |
| CALA-14-79447 | LLAO-4 | FD | EPA:905.0 | 0 | 1 |
| CALA-14-79447 | LLAO-4 | FD | HASL-300:AM-241 | 0 | 1 |
| CALA-14-79447 | LLAO-4 | FD | HASL-300:ISOPU | 0 | 2 |
| CALA-14-79447 | LLAO-4 | FD | HASL-300:ISOU | 0 | 3 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:8011 | 0 | 2 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:8081B | 0 | 1 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:8082 | 0 | 8 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:8151A | 0 | 1 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:8260B | 0 | 78 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:8270D | 0 | 60 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:8310 | 0 | 18 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:8321A_MOD | 0 | 20 |
| CALA-14-79447 | LLAO-4 | FD | SW-846:9060 | 0 | 1 |
| CALA-14-79448 | LLAO-4 | FD | EPA:120.1 | 0 | 1 |
| CALA-14-79448 | LLAO-4 | FD | EPA:150.1 | 0 | 1 |
| CALA-14-79448 | LLAO-4 | FD | EPA:160.1 | 0 | 1 |
| CALA-14-79448 | LLAO-4 | FD | EPA:245.2 | 0 | 1 |
| CALA-14-79448 | LLAO-4 | FD | EPA:300.0 | 0 | 4 |
| CALA-14-79448 | LLAO-4 | FD | EPA:310.1 | 0 | 2 |
| CALA-14-79448 | LLAO-4 | FD | EPA:350.1 | 0 | 1 |
| CALA-14-79448 | LLAO-4 | FD | EPA:353.2 | 0 | 1 |
| CALA-14-79448 | LLAO-4 | FD | EPA:365.4 | 0 | 1 |
| CALA-14-79448 | LLAO-4 | FD | SM:A2340B | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CALA-14-79448 | LLAO-4 | FD | SW-846:6010C | 0 | 17 |
| CALA-14-79448 | LLAO-4 | FD | SW-846:6020 | 0 | 11 |
| CALA-14-79448 | LLAO-4 | FD | SW-846:6850 | 0 | 1 |
| CALA-14-79451 | LLAO-4 | FTB | SW-846:8011 | 0 | 2 |
| CALA-14-79451 | LLAO-4 | FTB | SW-846:8260B | 0 | 80 |
| CALA-14-79458 | LLAO-4 | REG | EPA:245.2 | 0 | 1 |
| CALA-14-79458 | LLAO-4 | REG | EPA:335.4 | 0 | 1 |
| CALA-14-79458 | LLAO-4 | REG | EPA:351.2 | 0 | 1 |
| CALA-14-79458 | LLAO-4 | REG | EPA:900 | 0 | 2 |
| CALA-14-79458 | LLAO-4 | REG | EPA:901.1 | 0 | 5 |
| CALA-14-79458 | LLAO-4 | REG | EPA:905.0 | 0 | 1 |
| CALA-14-79458 | LLAO-4 | REG | HASL-300:AM-241 | 0 | 1 |
| CALA-14-79458 | LLAO-4 | REG | HASL-300:ISOPU | 0 | 2 |
| CALA-14-79458 | LLAO-4 | REG | HASL-300:ISOU | 0 | 3 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:8011 | 0 | 2 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:8081B | 0 | 1 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:8082 | 0 | 8 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:8151A | 0 | 1 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:8260B | 0 | 78 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:8270D | 0 | 60 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:8310 | 0 | 18 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:8321A_MOD | 0 | 20 |
| CALA-14-79458 | LLAO-4 | REG | SW-846:9060 | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | EPA:120.1 | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | EPA:150.1 | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | EPA:160.1 | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | EPA:245.2 | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | EPA:300.0 | 0 | 4 |
| CALA-14-79464 | LLAO-4 | REG | EPA:310.1 | 0 | 2 |
| CALA-14-79464 | LLAO-4 | REG | EPA:350.1 | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | EPA:353.2 | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | EPA:365.4 | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | SM:A2340B | 0 | 1 |
| CALA-14-79464 | LLAO-4 | REG | SW-846:6010C | 0 | 17 |
| CALA-14-79464 | LLAO-4 | REG | SW-846:6020 | 0 | 11 |
| CALA-14-79464 | LLAO-4 | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

July 15, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Groundwater Samples
Work Order: 350951
SDG: 2014-3574

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 19, 2014, and analyzed for Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2014-3574
Enclosures

**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Work Order #: 350951**
**SDG: 2014-3574**

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# Case Narrative

**Case Narrative for**
**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Workorder #: 350951**
**SDG # : 2014-3574**

**July 15, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 19, 2014 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 350951001 | CALA-14-79458 |
| 350951002 | CALA-14-79458 |
| 350951003 | CALA-14-79458 |
| 350951004 | CALA-14-79458 |
| 350951005 | CALA-14-79458 |
| 350951006 | CALA-14-79458 |
| 350951007 | CALA-14-79458 |
| 350951008 | CALA-14-79464 |
| 350951009 | CALA-14-79446 |
| 350951010 | CALA-14-79446 |
| 350951011 | CALA-14-79446 |
| 350951012 | CALA-14-79446 |
| 350951013 | CALA-14-79446 |
| 350951014 | CALA-14-79446 |
| 350951015 | CALA-14-79447 |
| 350951016 | CALA-14-79447 |
| 350951017 | CALA-14-79447 |
| 350951018 | CALA-14-79447 |
| 350951019 | CALA-14-79447 |
| 350951020 | CALA-14-79447 |
| 350951021 | CALA-14-79447 |
| 350951022 | CALA-14-79448 |
| 350951023 | CALA-14-79451 |
| 350951024 | CALA-14-79451 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 15 July 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−14−9 |
| Utah NELAP | SC000122014−13 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

350951

# Chain of Custody/Analysis Request

ADEP

**COC/Lab Request #:** 2014-3574

Page 1 of 1

**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8081A-HCB | WSP-LL-8151A-PCP | WSP-LL-8260B | WSP-LL-8270C | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-79458 | Jun 17 2014 | 11:04 | W | 1 | 2 | 3 | 2 | 3 | 2 | 3 | | 1 | | 1 | 2 | 2 | 2 | 1 | | 1 | 1 | | |
| CALA-14-79464 | Jun 17 2014 | 11:04 | W | | | | | | | | 1 | | 1 | | | | | | 1 | | | | |
| CALA-14-79446 | Jun 17 2014 | 11:04 | W | | 2 | 3 | 2 | 3 | 2 | | | | | | 2 | 2 | 2 | 1 | | | | | |
| CALA-14-79447 | Jun 17 2014 | 11:04 | W | 1 | 2 | 3 | 2 | 3 | 2 | 3 | | 1 | | 1 | 2 | 2 | 2 | 1 | | 1 | 1 | | |
| CALA-14-79448 | Jun 17 2014 | 11:04 | W | | | | | | | | 1 | | 1 | | | | | | 1 | | | | |
| CALA-14-79451 | Jun 17 2014 | 11:04 | W | | 2 | | 2 | | | | | | | | | | | | | | | | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | Melissa Martz | 6/17/14 3:40 | P. Went | Patricia Dent | 6/19/14 0850 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| **Client:** LANL | **SDG/AR/COC/Work Order:** 2014-3574 |
| **Received By:** PNent | **Date Received:** 6/19/14 |

| **Suspected Hazard Information** | **Yes** | **No** | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | X | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0CPM |
| Classified Radioactive II or III by RSO? | | X | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | X | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | X | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | X | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | X | |

| | **Sample Receipt Criteria** | **Yes** | **NA** | **No** | **Comments/Qualifiers (Required for Non-Conforming Items)** |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | X | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) 3,4,19 *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | X | | | Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966 |
| 3 | Chain of custody documents included with shipment? | X | | | |
| 4 | Sample containers intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | X | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | X | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | X | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | X | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | X | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | X | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | X | | X | Sample ID's affected: Please See Continuation Sheet |
| 12 | Are sample containers identifiable as GEL provided? | | | X | |
| 13 | COC form is properly signed in relinquished/received sections? | X | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other<br>5908 1777 1869<br>" " 1906<br>" " 1891<br>" " 1880<br>" " 1870<br>3,4,19 |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials PH Date 061914 Page 1 of 1

GEL Laboratories LLC **SAMPLE RECEIPT & REVIEW CONTINUATION FORM**

2014-3574

**Client:** LANL **Received By:** P. Nlent **Date Received:** 6/19/14 **SDG/AR/COC/Work Order:** ~~350951~~ HH

CALA-14-79451 For 8011-EDB, 8260b Lab rec'd (1) instead of (2)

CALA-14-79446 - For PCB, 79447 For HEXP, & PCB Lab rec'd (1) Container Each chain indicates (3) Each

CALA-14-79446, 79447 For SVOA Lab rec'd (2) Containers instead of (4) as indicated on chain.

CALA-14-79446, 79447 For HCB, PAH & PCP Lab rec'd (2) Containers Each chain indicates (3) each

CALA-14-79458 For SVOA Lab rec'd (3) Containers Chain indicates (4).

PM (or PMA) review: Initials HH Date 06/19/14 Page 1 of 1

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18JUN14
ACTWGT: 38.0 LB MAN
CAD: 0014176/CAFE2804

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

3

521C5/9BC4/6F03

FedEx Express

J1412140522012 6

1 of 2

TRK# 0201 5908 1777 1891

## MASTER ##

XX CHSA

THU - 19 JUN 10:30A
PRIORITY OVERNIGHT

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18JUN14
ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2804

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

3

521C5/9BC4/6F03

FedEx Express

J1412140522012 6

3 of 3

MPS# 0263 5908 1777 1880

Mstr# 5908 1777 1869 0201

XX CHSA

THU - 19 JUN 10:30A
PRIORITY OVERNIGHT

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18JUN14
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2804

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

4

521C5/9BC4/6F03

FedEx Express

J1412140522012 6

1 of 3

TRK# 0201 5908 1777 1869
## MASTER ##

THU - 19 JUN 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18JUN14
ACTWGT: 30.0 LB MAN
CAD: 0014176/CAFE2804

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

3

521C5/9BC4/6F03

FedEx Express

J1412140522012 6

2 of 2

MPS# 0263 5908 1777 1906
Mstr# 5908 1777 1891

0201

THU - 19 JUN 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18JUN14
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2804

BILL SENDER

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19

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FedEx Express

J1412140522012 6

2 of 3

MPS# 0263 5908 1777 1870
Mstr# 5908 1777 1869

0201

XX CHSA

THU - 19 JUN 10:30A
PRIORITY OVERNIGHT

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# Case Narrative

**ChemStation Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer** |
| Analytical Method: | SW846 8260B DOE-AL |
| Analytical Batch Number: | 1399998 |

## Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951014 | CALA-14-79446 |
| 350951019 | CALA-14-79447 |
| 350951024 | CALA-14-79451 |
| 1203119463 | Method Blank (MB) |
| 1203119464 | 350951005(CALA-14-79458) Post Spike (PS) |
| 1203119465 | 350951005(CALA-14-79458) Post Spike Duplicate (PSD) |
| 1203119466 | Laboratory Control Sample (LCS) |
| 1203119467 | Laboratory Control Sample (LCS) |
| 1203119472 | 350951005(CALA-14-79458) Post Spike (PS) |
| 1203119473 | 350951005(CALA-14-79458) Post Spike Duplicate (PSD) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a ’d’ qualifier.

## Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Blank (MB) Statement**
The blank analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

**Laboratory Control Sample (LCS) Recovery**
The LCS 1203119466 (LCS) and 1203119467 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. See the Data Exception Report in the miscellaneous section of the data package.

**QC Sample Designation**
Sample 350951005 (CALA-14-79458) was designated for spike analysis.

**Matrix Spike (PS) Recovery Statement**
The spike 1203119464 (CALA-14-79458) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

**Matrix Spike Duplicate (PSD) Recovery Statement**
The spike duplicate 1203119465 (CALA-14-79458) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

**Relative Percent Difference (RPD) Statement**
The RPDs between the matrix spike pair met the acceptance limits.

**Internal Standard (ISTD) Acceptance**
The internal standard responses in all client and quality control samples met the required acceptance criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Sample Preservation and Integrity**
All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-analyses were not required for samples in this SDG.

**Miscellaneous Information**

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1313715.

**Manual Integrations**
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

**TIC Comment**
Tentatively identified compounds (TIC) were requested for this sample delivery group/work order. Please note that non-requested target analytes that are reported on the quantitation reports will be present on the Form I. These detected analytes are included in the calibrated method and as a result will be reported on the Sample Data Summary (Form I) or Certificate of Analysis (C of A). TIC data are included on the Sample Data Summary (Form I).

**Additional Comments**
Additional comments were not required for this SDG.

**Residual Chlorine**
Residual Chlorine was not detected in any of the samples in this SDG.

**System Configuration**

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|---|---|---|---|---|---|
| VOA6.I | Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler | HP6890N/HP5975 | DB-624 | J&W, 60m x 0.25mm x 1.4um | Trap 10 |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 − (843) 556−8171 − www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS−LANS−MTOA6−25093−GEL)

Client SDG: 2014−3574 GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re−analyzed without re−extraction.
RE Indicates that sample is re−extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert **Name: Erin Haubert**

**Date: 16 JUL 2014** **Title: Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951005** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 14:10** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 14:10** | | | | |
| **Data File:** | **070114V6\6P209.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951005** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 14:10** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 14:10** | | | | |
| **Data File:** | **070114V6\6P209.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951005** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 14:10** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 14:10** | | | | |
| **Data File:** | **070114V6\6P209.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 45.5 | 50.0 | ug/L | 91.0 | (78%-124%) |
| Bromofluorobenzene | 47.7 | 50.0 | ug/L | 95.4 | (80%-120%) |
| Toluene-d8 | 48.0 | 50.0 | ug/L | 96.0 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 3.776 | 56.3 | ug/L | 0 | J |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951014** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 14:39** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 14:39** | | | | |
| **Data File:** | **070114V6\6P210.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951014** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 14:39** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 14:39** | | | | |
| **Data File:** | **070114V6\6P210.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951014** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 14:39** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 14:39** | | | | |
| **Data File:** | **070114V6\6P210.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.6 | 50.0 | ug/L | 89.2 | (78%-124%) |
| Bromofluorobenzene | 48.2 | 50.0 | ug/L | 96.3 | (80%-120%) |
| Toluene-d8 | 48.2 | 50.0 | ug/L | 96.4 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951019** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 15:09** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 15:09** | | | | |
| **Data File:** | **070114V6\6P211.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951019** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 15:09** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 15:09** | | | | |
| **Data File:** | **070114V6\6P211.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951019** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 15:09** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 15:09** | | | | |
| **Data File:** | **070114V6\6P211.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 45.3 | 50.0 | ug/L | 90.6 | (78%-124%) |
| Bromofluorobenzene | 47.9 | 50.0 | ug/L | 95.9 | (80%-120%) |
| Toluene-d8 | 48.0 | 50.0 | ug/L | 96.0 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 3.768 | 18.6 | ug/L | 0 | J |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951024** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79451** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 15:38** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 15:38** | | | | |
| **Data File:** | **070114V6\6P212.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951024** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79451** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 15:38** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 15:38** | | | | |
| **Data File:** | **070114V6\6P212.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951024** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79451** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 15:38** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 15:38** | | | | |
| **Data File:** | **070114V6\6P212.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.8 | 50.0 | ug/L | 89.6 | (78%-124%) |
| Bromofluorobenzene | 48.0 | 50.0 | ug/L | 95.9 | (80%-120%) |
| Toluene-d8 | 47.5 | 50.0 | ug/L | 95.0 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Quality Control Summary

**Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-3574**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|---|---|---|---|---|
| 1203119466 | LCS for batch 1399998 | 86 | 93 | 91 |
| 1203119467 | LCS for batch 1399998 | 88 | 94 | 94 |
| 1203119463 | MB for batch 1399998 | 86 | 94 | 94 |
| 350951005 | CALA-14-79458 | 91 | 96 | 95 |
| 350951014 | CALA-14-79446 | 89 | 96 | 96 |
| 350951019 | CALA-14-79447 | 91 | 96 | 96 |
| 350951024 | CALA-14-79451 | 90 | 95 | 96 |
| 1203119464 | CALA-14-79458PS | 88 | 94 | 92 |
| 1203119465 | CALA-14-79458PSD | 88 | 95 | 93 |
| 1203119472 | CALA-14-79458PS | 90 | 95 | 95 |
| 1203119473 | CALA-14-79458PSD | 93 | 99 | 99 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| DCED4 | = 1,2-Dichloroethane-d4 | (78%-124%) |
| TOL | = Toluene-d8 | (80%-120%) |
| BFB | = Bromofluorobenzene | (80%-120%) |

* Recovery outside Acceptance Limits

\# Column to be used to flag recovery values

D Sample Diluted

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119464**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:05**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PS | m,p-Xylenes | 100 | 0.00 | U | 103 | 103 | 72-120 |
| 75-05-8 | PS | Acetonitrile | 1250 | 0.00 | U | 959 | 77 | 61-135 |
| 67-64-1 | PS | Acetone | 250 | 0.00 | U | 70.1 | 28 * | 29-144 |
| 74-88-4 | PS | Iodomethane | 250 | 0.00 | U | 278 | 111 | 73-120 |
| 75-15-0 | PS | Carbon disulfide | 250 | 0.00 | U | 269 | 107 | 79-138 |
| 108-05-4 | PS | Vinyl acetate | 250 | 0.00 | U | 291 | 116 | 60-136 |
| 78-93-3 | PS | 2-Butanone | 250 | 0.00 | U | 94.6 | 38 | 38-136 |
| 108-10-1 | PS | 4-Methyl-2-pentanone | 250 | 0.00 | U | 192 | 77 | 70-132 |
| 591-78-6 | PS | 2-Hexanone | 250 | 0.00 | U | 116 | 46 * | 48-137 |
| 75-71-8 | PS | Dichlorodifluoromethane | 50.0 | 0.00 | U | 43.3 | 87 | 51-133 |
| 74-87-3 | PS | Chloromethane | 50.0 | 0.00 | U | 39.8 | 80 | 54-135 |
| 75-01-4 | PS | Vinyl chloride | 50.0 | 0.00 | U | 49.0 | 98 | 52-129 |
| 74-83-9 | PS | Bromomethane | 50.0 | 0.00 | U | 54.3 | 109 | 67-128 |
| 75-00-3 | PS | Chloroethane | 50.0 | 0.00 | U | 50.6 | 101 | 69-120 |
| 75-69-4 | PS | Trichlorofluoromethane | 50.0 | 0.00 | U | 56.7 | 113 | 66-126 |
| 60-29-7 | PS | Ethyl ether | 50.0 | 0.00 | U | 45.6 | 91 | 69-120 |
| 75-35-4 | PS | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 48.1 | 96 | 74-130 |
| 75-09-2 | PS | Methylene chloride | 50.0 | 1.28 | U | 36.6 | 71 * | 73-120 |
| 1634-04-4 | PS | tert-Butyl methyl ether | 50.0 | 0.00 | U | 49.4 | 99 | 71-124 |
| 156-60-5 | PS | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 47.9 | 96 | 75-124 |
| 75-34-3 | PS | 1,1-Dichloroethane | 50.0 | 0.00 | U | 48.5 | 97 | 76-122 |
| 156-59-2 | PS | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 47.6 | 95 | 77-121 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119464**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:05**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PS | 2,2-Dichloropropane | 50.0 | 0.00 | U | 53.3 | 107 | 72-129 |
| 74-97-5 | PS | Bromochloromethane | 50.0 | 0.00 | U | 54.7 | 109 | 78-122 |
| 67-66-3 | PS | Chloroform | 50.0 | 0.00 | U | 50.5 | 101 | 75-123 |
| 71-55-6 | PS | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 53.3 | 107 | 76-129 |
| 563-58-6 | PS | 1,1-Dichloropropene | 50.0 | 0.00 | U | 50.5 | 101 | 76-125 |
| 56-23-5 | PS | Carbon tetrachloride | 50.0 | 0.00 | U | 55.8 | 112 | 76-132 |
| 107-06-2 | PS | 1,2-Dichloroethane | 50.0 | 0.00 | U | 46.8 | 94 | 68-128 |
| 71-43-2 | PS | Benzene | 50.0 | 0.00 | U | 50.5 | 101 | 75-120 |
| 79-01-6 | PS | Trichloroethylene | 50.0 | 0.00 | U | 53.3 | 107 | 75-125 |
| 78-87-5 | PS | 1,2-Dichloropropane | 50.0 | 0.00 | U | 47.7 | 95 | 75-120 |
| 74-95-3 | PS | Dibromomethane | 50.0 | 0.00 | U | 51.0 | 102 | 77-122 |
| 75-27-4 | PS | Bromodichloromethane | 50.0 | 0.00 | U | 51.1 | 102 | 76-129 |
| 10061-01-5 | PS | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 51.6 | 103 | 75-127 |
| 108-88-3 | PS | Toluene | 50.0 | 0.00 | U | 49.2 | 98 | 72-120 |
| 10061-02-6 | PS | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 49.4 | 99 | 73-123 |
| 79-00-5 | PS | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 47.6 | 95 | 77-120 |
| 142-28-9 | PS | 1,3-Dichloropropane | 50.0 | 0.00 | U | 47.4 | 95 | 73-120 |
| 127-18-4 | PS | Tetrachloroethylene | 50.0 | 0.00 | U | 55.4 | 111 | 67-124 |
| 124-48-1 | PS | Dibromochloromethane | 50.0 | 0.00 | U | 54.5 | 109 | 70-130 |
| 106-93-4 | PS | 1,2-Dibromoethane | 50.0 | 0.00 | U | 51.1 | 102 | 79-122 |
| 108-90-7 | PS | Chlorobenzene | 50.0 | 0.00 | U | 51.1 | 102 | 74-120 |
| 100-41-4 | PS | Ethylbenzene | 50.0 | 0.00 | U | 49.7 | 99 | 72-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119464**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:05**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 95-47-6 | PS | o-Xylene | 50.0 | 0.00 | U | 50.1 | 100 | 72-120 |
| 100-42-5 | PS | Styrene | 50.0 | 0.00 | U | 50.5 | 101 | 74-124 |
| 75-25-2 | PS | Bromoform | 50.0 | 0.00 | U | 51.9 | 104 | 61-135 |
| 98-82-8 | PS | Isopropylbenzene | 50.0 | 0.00 | U | 49.8 | 100 | 71-124 |
| 79-34-5 | PS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 47.8 | 96 | 74-124 |
| 96-18-4 | PS | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 47.4 | 95 | 71-125 |
| 108-86-1 | PS | Bromobenzene | 50.0 | 0.00 | U | 50.3 | 101 | 72-120 |
| 103-65-1 | PS | n-Propylbenzene | 50.0 | 0.00 | U | 47.3 | 95 | 69-121 |
| 108-67-8 | PS | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 50.0 | 100 | 71-123 |
| 95-49-8 | PS | 2-Chlorotoluene | 50.0 | 0.00 | U | 50.6 | 101 | 71-120 |
| 106-43-4 | PS | 4-Chlorotoluene | 50.0 | 0.00 | U | 47.9 | 96 | 70-120 |
| 98-06-6 | PS | tert-Butylbenzene | 50.0 | 0.00 | U | 52.9 | 106 | 72-124 |
| 95-63-6 | PS | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 48.1 | 96 | 71-122 |
| 135-98-8 | PS | sec-Butylbenzene | 50.0 | 0.00 | U | 51.5 | 103 | 71-124 |
| 99-87-6 | PS | 4-Isopropyltoluene | 50.0 | 0.00 | U | 52.0 | 104 | 70-124 |
| 541-73-1 | PS | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 51.6 | 103 | 70-120 |
| 106-46-7 | PS | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 49.7 | 99 | 70-120 |
| 104-51-8 | PS | n-Butylbenzene | 50.0 | 0.00 | U | 50.5 | 101 | 69-125 |
| 96-12-8 | PS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 | U | 45.8 | 92 | 60-130 |
| 87-68-3 | PS | Hexachlorobutadiene | 50.0 | 0.00 | U | 60.8 | 122 | 60-129 |
| 91-20-3 | PS | Naphthalene | 50.0 | 0.00 | U | 55.8 | 112 | 58-134 |
| 87-61-6 | PS | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 60.9 | 122 | 52-132 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119464**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:05**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 120-82-1 | PS | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 57.7 | 115 | 59-126 |
| 630-20-6 | PS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 54.2 | 108 | 78-128 |
| 95-50-1 | PS | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 51.5 | 103 | 72-120 |
| 71-36-3 | PS | n-Butyl alcohol | 5000 | 0.00 | U | 4680 | 94 | 64-138 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119465**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:34**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PSD | m,p-Xylenes | 100 | 0.00 | U | 105 | 105 | 72-120 | 2 | 0-20 |
| 75-05-8 | PSD | Acetonitrile | 1250 | 0.00 | U | 944 | 76 | 61-135 | 2 | 0-20 |
| 67-64-1 | PSD | Acetone | 250 | 0.00 | U | 68.4 | 27 * | 29-144 | 2 | 0-20 |
| 74-88-4 | PSD | Iodomethane | 250 | 0.00 | U | 281 | 112 | 73-120 | 1 | 0-20 |
| 75-15-0 | PSD | Carbon disulfide | 250 | 0.00 | U | 273 | 109 | 79-138 | 1 | 0-20 |
| 108-05-4 | PSD | Vinyl acetate | 250 | 0.00 | U | 287 | 115 | 60-136 | 1 | 0-20 |
| 78-93-3 | PSD | 2-Butanone | 250 | 0.00 | U | 92.4 | 37 * | 38-136 | 2 | 0-20 |
| 108-10-1 | PSD | 4-Methyl-2-pentanone | 250 | 0.00 | U | 188 | 75 | 70-132 | 2 | 0-20 |
| 591-78-6 | PSD | 2-Hexanone | 250 | 0.00 | U | 114 | 46 * | 48-137 | 2 | 0-20 |
| 75-71-8 | PSD | Dichlorodifluoromethane | 50.0 | 0.00 | U | 43.4 | 87 | 51-133 | 0 | 0-20 |
| 74-87-3 | PSD | Chloromethane | 50.0 | 0.00 | U | 39.3 | 79 | 54-135 | 1 | 0-20 |
| 75-01-4 | PSD | Vinyl chloride | 50.0 | 0.00 | U | 48.8 | 98 | 52-129 | 0 | 0-20 |
| 74-83-9 | PSD | Bromomethane | 50.0 | 0.00 | U | 54.6 | 109 | 67-128 | 1 | 0-20 |
| 75-00-3 | PSD | Chloroethane | 50.0 | 0.00 | U | 51.2 | 102 | 69-120 | 1 | 0-20 |
| 75-69-4 | PSD | Trichlorofluoromethane | 50.0 | 0.00 | U | 57.5 | 115 | 66-126 | 1 | 0-20 |
| 60-29-7 | PSD | Ethyl ether | 50.0 | 0.00 | U | 45.6 | 91 | 69-120 | 0 | 0-20 |
| 75-35-4 | PSD | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 48.7 | 97 | 74-130 | 1 | 0-20 |
| 75-09-2 | PSD | Methylene chloride | 50.0 | 1.28 | U | 37.3 | 72 * | 73-120 | 2 | 0-20 |
| 1634-04-4 | PSD | tert-Butyl methyl ether | 50.0 | 0.00 | U | 49.3 | 99 | 71-124 | 0 | 0-20 |
| 156-60-5 | PSD | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 48.7 | 97 | 75-124 | 2 | 0-20 |
| 75-34-3 | PSD | 1,1-Dichloroethane | 50.0 | 0.00 | U | 49.2 | 98 | 76-122 | 1 | 0-20 |
| 156-59-2 | PSD | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 47.8 | 96 | 77-121 | 0 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119465**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:34**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PSD | 2,2-Dichloropropane | 50.0 | 0.00 | U | 54.2 | 108 | 72-129 | 2 | 0-20 |
| 74-97-5 | PSD | Bromochloromethane | 50.0 | 0.00 | U | 54.9 | 110 | 78-122 | 0 | 0-20 |
| 67-66-3 | PSD | Chloroform | 50.0 | 0.00 | U | 51.1 | 102 | 75-123 | 1 | 0-20 |
| 71-55-6 | PSD | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 54.7 | 109 | 76-129 | 3 | 0-20 |
| 563-58-6 | PSD | 1,1-Dichloropropene | 50.0 | 0.00 | U | 52.0 | 104 | 76-125 | 3 | 0-20 |
| 56-23-5 | PSD | Carbon tetrachloride | 50.0 | 0.00 | U | 57.4 | 115 | 76-132 | 3 | 0-20 |
| 107-06-2 | PSD | 1,2-Dichloroethane | 50.0 | 0.00 | U | 46.9 | 94 | 68-128 | 0 | 0-20 |
| 71-43-2 | PSD | Benzene | 50.0 | 0.00 | U | 51.5 | 103 | 75-120 | 2 | 0-20 |
| 79-01-6 | PSD | Trichloroethylene | 50.0 | 0.00 | U | 54.2 | 108 | 75-125 | 2 | 0-20 |
| 78-87-5 | PSD | 1,2-Dichloropropane | 50.0 | 0.00 | U | 48.4 | 97 | 75-120 | 1 | 0-20 |
| 74-95-3 | PSD | Dibromomethane | 50.0 | 0.00 | U | 51.2 | 102 | 77-122 | 0 | 0-20 |
| 75-27-4 | PSD | Bromodichloromethane | 50.0 | 0.00 | U | 51.7 | 103 | 76-129 | 1 | 0-20 |
| 10061-01-5 | PSD | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 52.2 | 104 | 75-127 | 1 | 0-20 |
| 108-88-3 | PSD | Toluene | 50.0 | 0.00 | U | 50.0 | 100 | 72-120 | 2 | 0-20 |
| 10061-02-6 | PSD | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 49.2 | 98 | 73-123 | 0 | 0-20 |
| 79-00-5 | PSD | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 47.7 | 95 | 77-120 | 0 | 0-20 |
| 142-28-9 | PSD | 1,3-Dichloropropane | 50.0 | 0.00 | U | 47.5 | 95 | 73-120 | 0 | 0-20 |
| 127-18-4 | PSD | Tetrachloroethylene | 50.0 | 0.00 | U | 56.8 | 114 | 67-124 | 3 | 0-20 |
| 124-48-1 | PSD | Dibromochloromethane | 50.0 | 0.00 | U | 54.9 | 110 | 70-130 | 1 | 0-20 |
| 106-93-4 | PSD | 1,2-Dibromoethane | 50.0 | 0.00 | U | 50.8 | 102 | 79-122 | 0 | 0-20 |
| 108-90-7 | PSD | Chlorobenzene | 50.0 | 0.00 | U | 52.1 | 104 | 74-120 | 2 | 0-20 |
| 100-41-4 | PSD | Ethylbenzene | 50.0 | 0.00 | U | 50.9 | 102 | 72-120 | 2 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119465**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:34**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-47-6 | PSD | o-Xylene | 50.0 | 0.00 | U | 51.2 | 102 | 72-120 | 2 | 0-20 |
| 100-42-5 | PSD | Styrene | 50.0 | 0.00 | U | 51.2 | 102 | 74-124 | 1 | 0-20 |
| 75-25-2 | PSD | Bromoform | 50.0 | 0.00 | U | 52.0 | 104 | 61-135 | 0 | 0-20 |
| 98-82-8 | PSD | Isopropylbenzene | 50.0 | 0.00 | U | 51.7 | 103 | 71-124 | 4 | 0-20 |
| 79-34-5 | PSD | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 48.0 | 96 | 74-124 | 0 | 0-20 |
| 96-18-4 | PSD | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 47.6 | 95 | 71-125 | 0 | 0-20 |
| 108-86-1 | PSD | Bromobenzene | 50.0 | 0.00 | U | 51.3 | 103 | 72-120 | 2 | 0-20 |
| 103-65-1 | PSD | n-Propylbenzene | 50.0 | 0.00 | U | 48.8 | 98 | 69-121 | 3 | 0-20 |
| 108-67-8 | PSD | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 51.6 | 103 | 71-123 | 3 | 0-20 |
| 95-49-8 | PSD | 2-Chlorotoluene | 50.0 | 0.00 | U | 52.1 | 104 | 71-120 | 3 | 0-20 |
| 106-43-4 | PSD | 4-Chlorotoluene | 50.0 | 0.00 | U | 49.0 | 98 | 70-120 | 2 | 0-20 |
| 98-06-6 | PSD | tert-Butylbenzene | 50.0 | 0.00 | U | 55.1 | 110 | 72-124 | 4 | 0-20 |
| 95-63-6 | PSD | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 49.1 | 98 | 71-122 | 2 | 0-20 |
| 135-98-8 | PSD | sec-Butylbenzene | 50.0 | 0.00 | U | 53.0 | 106 | 71-124 | 3 | 0-20 |
| 99-87-6 | PSD | 4-Isopropyltoluene | 50.0 | 0.00 | U | 53.0 | 106 | 70-124 | 2 | 0-20 |
| 541-73-1 | PSD | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 52.3 | 105 | 70-120 | 1 | 0-20 |
| 106-46-7 | PSD | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 50.2 | 100 | 70-120 | 1 | 0-20 |
| 104-51-8 | PSD | n-Butylbenzene | 50.0 | 0.00 | U | 51.3 | 103 | 69-125 | 2 | 0-20 |
| 96-12-8 | PSD | 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 | U | 45.1 | 90 | 60-130 | 2 | 0-20 |
| 87-68-3 | PSD | Hexachlorobutadiene | 50.0 | 0.00 | U | 61.5 | 123 | 60-129 | 1 | 0-20 |
| 91-20-3 | PSD | Naphthalene | 50.0 | 0.00 | U | 56.4 | 113 | 58-134 | 1 | 0-20 |
| 87-61-6 | PSD | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 61.6 | 123 | 52-132 | 1 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Sample Type:** **Post Spike Duplicate**
**Client ID:** **CALA-14-79458PSD**
**Matrix:** **W**
**Lab Sample ID** **1203119465**
**Instrument:** **VOA6.I**
**Analysis Date:** **07/01/2014 20:34**
**Dilution: 1**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-82-1 | PSD | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 58.3 | 117 | 59-126 | 1 | 0-20 |
| 630-20-6 | PSD | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 54.3 | 109 | 78-128 | 0 | 0-20 |
| 95-50-1 | PSD | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 51.9 | 104 | 72-120 | 1 | 0-20 |
| 71-36-3 | PSD | n-Butyl alcohol | 5000 | 0.00 | U | 4570 | 91 | 64-138 | 3 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119466**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 11:13**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 97.2 | 97 | 80-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 879 | 70 | 63-131 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 152 | 61 | 50-149 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 257 | 103 | 75-120 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 248 | 99 | 80-136 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 289 | 115 | 78-130 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 150 | 60 | 57-148 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 190 | 76 | 75-130 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 160 | 64 | 64-149 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 42.3 | 85 | 58-129 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 37.4 | 75 | 59-131 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 46.0 | 92 | 59-127 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 49.9 | 100 | 70-125 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 47.7 | 95 | 73-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 55.1 | 110 | 73-123 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 44.2 | 88 | 73-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 44.5 | 89 | 80-128 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 33.3 | 67 * | 75-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 46.6 | 93 | 74-122 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 44.7 | 89 | 80-121 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 45.0 | 90 | 79-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 44.1 | 88 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119466**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 11:13**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 50.2 | 100 | 79-130 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 51.6 | 103 | 80-121 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 47.1 | 94 | 79-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 49.2 | 98 | 80-128 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 47.5 | 95 | 80-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 52.2 | 104 | 80-131 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 43.8 | 88 | 73-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 47.4 | 95 | 78-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 50.2 | 100 | 80-121 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 45.4 | 91 | 79-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 48.2 | 96 | 80-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 48.6 | 97 | 80-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 50.0 | 100 | 80-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 46.4 | 93 | 78-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 47.3 | 95 | 79-121 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 44.9 | 90 | 78-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 44.7 | 89 | 75-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 52.5 | 105 | 74-123 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 51.8 | 104 | 73-129 |
| 106-93-4 | LCS | 1,2-Dibromoethane | 50.0 | 0.0 | 48.2 | 96 | 80-120 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 48.6 | 97 | 79-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 47.2 | 94 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119466**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 11:13**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 47.3 | 95 | 80-123 |
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 47.8 | 96 | 80-121 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 49.8 | 100 | 65-135 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 47.3 | 95 | 79-121 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 44.8 | 90 | 76-123 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 45.4 | 91 | 76-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 48.5 | 97 | 79-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 44.8 | 90 | 80-123 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 47.3 | 95 | 80-120 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 47.9 | 96 | 79-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 45.1 | 90 | 79-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 49.8 | 100 | 79-122 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 45.4 | 91 | 80-120 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 48.7 | 97 | 80-121 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 48.8 | 98 | 80-121 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 49.0 | 98 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 47.0 | 94 | 78-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 47.5 | 95 | 80-123 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.0 | 43.2 | 86 | 66-125 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 58.3 | 117 | 71-128 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 52.6 | 105 | 64-132 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 58.7 | 117 | 61-132 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119466**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 11:13**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 56.0 | 112 | 66-130 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 51.2 | 102 | 80-125 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 48.6 | 97 | 78-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4350 | 87 | 67-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119467**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 12:41**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 267 | 107 | 65-126 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 207 | 83 | 73-132 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 162 | 65 * | 67-127 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 206 | 82 | 74-122 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 216 | 87 | 73-124 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 192 | 77 | 68-123 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 203 | 81 | 79-120 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 195 | 78 | 77-120 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 1990 | 80 | 72-133 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 38.7 | 77 | 57-142 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119472**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 21:03**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PS | Acrolein | 250 | 0.00 | U | 255 | 102 | 57-131 |
| 76-13-1 | PS | Trichlorotrifluoroethane | 250 | 0.00 | U | 232 | 93 | 76-133 |
| 107-05-1 | PS | Allyl chloride | 250 | 0.00 | U | 176 | 71 | 65-130 |
| 107-13-1 | PS | Acrylonitrile | 250 | 0.00 | U | 203 | 81 | 70-128 |
| 107-12-0 | PS | Propionitrile | 250 | 0.00 | U | 213 | 85 | 68-131 |
| 126-98-7 | PS | Methacrylonitrile | 250 | 0.00 | U | 190 | 76 | 64-129 |
| 80-62-6 | PS | Methyl methacrylate | 250 | 0.00 | U | 201 | 80 | 76-120 |
| 97-63-2 | PS | Ethyl methacrylate | 250 | 0.00 | U | 196 | 78 | 72-122 |
| 78-83-1 | PS | Isobutyl alcohol | 2500 | 0.00 | U | 1980 | 79 | 72-134 |
| 126-99-8 | PS | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 42.4 | 85 | 46-140 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119473**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 21:33**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PSD | Acrolein | 250 | 0.00 | U | 242 | 97 | 57-131 | 5 | 0-20 |
| 76-13-1 | PSD | Trichlorotrifluoroethane | 250 | 0.00 | U | 214 | 86 | 76-133 | 8 | 0-20 |
| 107-05-1 | PSD | Allyl chloride | 250 | 0.00 | U | 168 | 67 | 65-130 | 5 | 0-20 |
| 107-13-1 | PSD | Acrylonitrile | 250 | 0.00 | U | 192 | 77 | 70-128 | 6 | 0-20 |
| 107-12-0 | PSD | Propionitrile | 250 | 0.00 | U | 203 | 81 | 68-131 | 5 | 0-20 |
| 126-98-7 | PSD | Methacrylonitrile | 250 | 0.00 | U | 181 | 72 | 64-129 | 5 | 0-20 |
| 80-62-6 | PSD | Methyl methacrylate | 250 | 0.00 | U | 193 | 77 | 76-120 | 4 | 0-20 |
| 97-63-2 | PSD | Ethyl methacrylate | 250 | 0.00 | U | 188 | 75 | 72-122 | 4 | 0-20 |
| 78-83-1 | PSD | Isobutyl alcohol | 2500 | 0.00 | U | 1860 | 74 | 72-134 | 6 | 0-20 |
| 126-99-8 | PSD | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 40.4 | 81 | 46-140 | 5 | 0-20 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1399998** | **Instrument ID:** | **VOA6.I** | **Data File:** | **070114V6\6P208BAR.D** |
| **Lab Sample ID:** | **1203119463** | **Prep Date:** | **07/01/2014 13:41** | **Analyzed:** | **07/01/14 13:41** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| | Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 01 | LCS for batch 1399998 | 1203119466 | 070114V6\6P203LAR.D | 07/01/14 | 1113 |
| 02 | LCS for batch 1399998 | 1203119467 | 070114V6\6P206SHAR.D | 07/01/14 | 1241 |
| 03 | CALA-14-79458 | 350951005 | 070114V6\6P209.D | 07/01/14 | 1410 |
| 04 | CALA-14-79446 | 350951014 | 070114V6\6P210.D | 07/01/14 | 1439 |
| 05 | CALA-14-79447 | 350951019 | 070114V6\6P211.D | 07/01/14 | 1509 |
| 06 | CALA-14-79451 | 350951024 | 070114V6\6P212.D | 07/01/14 | 1538 |
| 07 | CALA-14-79458PS | 1203119464 | 070114V6\6P221.D | 07/01/14 | 2005 |
| 08 | CALA-14-79458PSD | 1203119465 | 070114V6\6P222.D | 07/01/14 | 2034 |
| 09 | CALA-14-79458PS | 1203119472 | 070114V6\6P223.D | 07/01/14 | 2103 |
| 10 | CALA-14-79458PSD | 1203119473 | 070114V6\6P224.D | 07/01/14 | 2133 |

# Quality Control Data

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119463** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 13:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 13:41** | | | | |
| **Data File:** | **070114V6\6P208BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119463** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 13:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 13:41** | | | | |
| **Data File:** | **070114V6\6P208BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119463** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 13:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 13:41** | | | | |
| **Data File:** | **070114V6\6P208BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 43.1 | 50.0 | ug/L | 86.1 | (78%-124%) |
| Bromofluorobenzene | 47.2 | 50.0 | ug/L | 94.4 | (80%-120%) |
| Toluene-d8 | 47.2 | 50.0 | ug/L | 94.4 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119464** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:05** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:05** | | | | |
| **Data File:** | **070114V6\6P221.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 54.2 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 53.3 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 47.8 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 47.6 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 48.5 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 48.1 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 50.5 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 60.9 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 47.4 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 57.7 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 48.1 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 45.8 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 51.1 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 51.5 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 46.8 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 47.7 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 50.0 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 51.6 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 47.4 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 49.7 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 53.3 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 94.6 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 50.6 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 116 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 47.9 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 52.0 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 192 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 70.1 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 959 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 50.3 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 54.7 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 51.1 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 51.9 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119464** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:05** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:05** | | | | |
| **Data File:** | **070114V6\6P221.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 54.3 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 269 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 55.8 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 51.1 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 50.6 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 50.5 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 39.8 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 54.5 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 51.0 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 43.3 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 45.6 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 49.7 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 60.8 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 278 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 49.8 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 36.6 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 55.8 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 50.5 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 55.4 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 49.2 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 53.3 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 56.7 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 291 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 49.0 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 47.6 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 51.6 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 103 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4680 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 47.3 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 50.1 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 51.5 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119464** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:05** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:05** | | | | |
| **Data File:** | **070114V6\6P221.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 49.4 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 52.9 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 47.9 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 49.4 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.1 | 50.0 | ug/L | 88.1 | (78%-124%) |
| Bromofluorobenzene | 46.0 | 50.0 | ug/L | 92.0 | (80%-120%) |
| Toluene-d8 | 47.1 | 50.0 | ug/L | 94.2 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119465** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:34** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:34** | | | | |
| **Data File:** | **070114V6\6P222.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 54.3 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 54.7 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 48.0 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 47.7 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 49.2 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 48.7 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 52.0 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 61.6 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 47.6 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 58.3 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 49.1 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 45.1 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 50.8 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 51.9 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 46.9 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 48.4 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 51.6 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 52.3 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 47.5 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 50.2 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 54.2 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 92.4 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 52.1 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 114 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 49.0 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 53.0 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 188 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 68.4 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 944 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 51.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 51.3 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 54.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 51.7 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 52.0 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119465** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:34** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:34** | | | | |
| **Data File:** | **070114V6\6P222.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 54.6 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 273 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 57.4 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 52.1 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 51.2 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 51.1 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 39.3 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 54.9 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 51.2 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 43.4 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 45.6 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 50.9 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 61.5 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 281 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 51.7 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 37.3 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 56.4 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 51.2 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 56.8 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 50.0 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 54.2 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 57.5 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 287 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 48.8 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 47.8 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 52.2 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 105 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4570 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 51.3 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 48.8 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 51.2 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 53.0 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119465** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:34** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:34** | | | | |
| **Data File:** | **070114V6\6P222.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 49.3 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 55.1 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 48.7 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 49.2 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.2 | 50.0 | ug/L | 88.4 | (78%-124%) |
| Bromofluorobenzene | 46.5 | 50.0 | ug/L | 93.0 | (80%-120%) |
| Toluene-d8 | 47.5 | 50.0 | ug/L | 94.9 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119466** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 11:13** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 11:13** | | | | |
| **Data File:** | **070114V6\6P203LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 51.2 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 49.2 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 44.8 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 44.9 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 45.0 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 44.5 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 47.5 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 58.7 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 45.4 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 56.0 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 45.4 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 43.2 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 48.2 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 48.6 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 43.8 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 45.4 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 47.3 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 49.0 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 44.7 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 47.0 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 50.2 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 150 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 47.9 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 160 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 45.1 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 48.8 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 190 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 152 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 879 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 47.4 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 48.5 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 51.6 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 48.6 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 49.8 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119466** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 11:13** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 11:13** | | | | |
| **Data File:** | **070114V6\6P203LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 49.9 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 248 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 52.2 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 48.6 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 47.7 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 47.1 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 37.4 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 51.8 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 48.2 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 42.3 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 44.2 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 47.2 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 58.3 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 257 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 47.3 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 33.3 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 52.6 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 47.8 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 52.5 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 46.4 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 50.2 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 55.1 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 289 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 46.0 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 44.1 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 50.0 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 97.2 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4350 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 47.5 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 44.8 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 47.3 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 48.7 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119466** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 11:13** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 11:13** | | | | |
| **Data File:** | **070114V6\6P203LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 46.6 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 49.8 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 44.7 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 47.3 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 43.2 | 50.0 | ug/L | 86.5 | (78%-124%) |
| Bromofluorobenzene | 45.3 | 50.0 | ug/L | 90.6 | (80%-120%) |
| Toluene-d8 | 46.5 | 50.0 | ug/L | 92.9 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119467** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 12:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 12:41** | | | | |
| **Data File:** | **070114V6\6P206SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 38.7 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 267 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 206 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 162 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119467** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 12:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 12:41** | | | | |
| **Data File:** | **070114V6\6P206SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 195 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 1990 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 192 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 203 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 216 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 207 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119467** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 12:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 12:41** | | | | |
| **Data File:** | **070114V6\6P206SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.1 | 50.0 | ug/L | 88.3 | (78%-124%) |
| Bromofluorobenzene | 47.2 | 50.0 | ug/L | 94.4 | (80%-120%) |
| Toluene-d8 | 46.8 | 50.0 | ug/L | 93.7 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119472** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:03** | | | | |
| **Data File:** | **070114V6\6P223.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 42.4 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 255 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 203 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 176 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119472** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:03** | | | | |
| **Data File:** | **070114V6\6P223.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 196 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 1980 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 190 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 201 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 213 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 232 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119472** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:03** | | | | |
| **Data File:** | **070114V6\6P223.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.9 | 50.0 | ug/L | 89.9 | (78%-124%) |
| Bromofluorobenzene | 47.6 | 50.0 | ug/L | 95.3 | (80%-120%) |
| Toluene-d8 | 47.7 | 50.0 | ug/L | 95.3 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119473** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:33** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:33** | | | | |
| **Data File:** | **070114V6\6P224.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 40.4 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 242 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 192 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 168 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119473** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:33** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:33** | | | | |
| **Data File:** | **070114V6\6P224.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 188 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 1860 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 181 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 193 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 203 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 214 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119473** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:33** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:33** | | | | |
| **Data File:** | **070114V6\6P224.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 46.4 | 50.0 | ug/L | 92.9 | (78%-124%) |
| Bromofluorobenzene | 49.7 | 50.0 | ug/L | 99.4 | (80%-120%) |
| Toluene-d8 | 49.4 | 50.0 | ug/L | 98.8 | (80%-120%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 14-JUL-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| VOA GC/MS | SW846 8260B DOE-AL | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1399998 | See Below | | |

**Potentially affected work order(s)(SDG): 350951(2014-3574),351059(2014-3584)**

**Application Issues:**

Failed Recovery for MS/PS

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. QC samples 1203119464MS and 1203119465MSD did not pass recoveries for all analytes. | 1. The MS/MSD pair recovered in a similar manner. The results are reported. |
| 2. QC samples 1203119466LCS and 1203119467LCS did not pass recoveries for all analytes. | 2. The unaccetpable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. |

**Originator's Name:**

Gelester Baskett 16-JUL-14

**Data Validator/Group Leader:**

Erin Haubert 16-JUL-14

# Semi-Volatile Analysis

# Case Narrative

**Semi-Volatile Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry** |
| Analytical Method: | SW846 3510C/8270D |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1398264 |
| Prep Batch Number: | 1398263 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951014 | CALA-14-79446 |
| 350951019 | CALA-14-79447 |
| 1203114923 | Method Blank (MB) |
| 1203114924 | Laboratory Control Sample (LCS) |
| 1203114925 | 351059005(CALA-14-79460) Matrix Spike (MS) |
| 1203114926 | 351059005(CALA-14-79460) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 32.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

**CCV Requirements**
All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. Detected concentrations of these analytes should be considered as estimated.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG in this batch met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The 1203114924 (LCS) recovered 4-Nitrophenol at 15.1%(limits are 16-77%) and 1,2,4,5-Tetracholrobenzene at 33.8% (limits are 36-95%). These failures are less than 5% of the total requested analytes. The data are reported.

**QC Sample Designation**
Sample 351059005 (CALA-14-79460) was selected for analysis as the matrix spike and matrix spike duplicate.

**Matrix Spike (MS) Recovery Statement**
The MS, 1203114925 (CALA-14-79460), recovered 4-Nitrophenol at 0% (limits are 16-71%), Hexachlorocyclopentadiene at 0% (limits are 14-73%) and Benzoic acid at 0% (limits are 10-105%). The MS and MSD recovered the spikes in a similar manner. The failures are attributed to matrix interference. The data are reported.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD, 1203114926 (CALA-14-79460), recovered 4-Nitrophenol at 0% (limits are 16-71%), Hexachlorocyclopentadiene at 0% (limits are 14-73%) and Benzoic acid at 0% (limits are 10-105%). The MS and MSD recovered the spikes in a similar manner. The failures are attributed to matrix interference. The data are reported.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPD value between the MS and MSD, 1203114925 (CALA-14-79460) and 1203114926 (CALA-14-79460), was not within the 0-30% limits for Benzidine at 64.3%. This failure is attributed to matrix interference. The data are reported.

**Internal Standard (ISTD) Acceptance**
Samples 350951005 (CALA-14-79458) and 350951014 (CALA-14-79446) failed ISTD acceptance criteria. The samples were re-analyzed and passed the acceptance criteria. The initial analysis data results are reported.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Samples 350951005 (CALA-14-79458) and 350951014 (CALA-14-79446) were re-analyzed due to internal standard responses outside of the acceptance criteria.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception report 1309179 was generated for the samples in this batch for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for samples 1203114923 (MB), 350951005 (CALA-14-79458), 350951014 (CALA-14-79446) and 350951019 (CALA-14-79447) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and

inserted into the electronic package.

**System Configuration**

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| MSD5.I | Agilent 6890/5973 GC/MS w/ 7683 Autosampler | HP6890/HP5973 | DB-5MS | 25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 14 JUL 2014**  **Title: Data Validator**

# Sample Data Summary

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951005** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 16:48** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **965 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2612.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 122-66-7 | Azobenzene | U | 10.4 | ug/L | 3.11 | 10.4 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 123-91-1 | 1,4-Dioxane | U | 10.4 | ug/L | 3.11 | 10.4 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.7 | ug/L | 5.18 | 20.7 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.04 | ug/L | 0.425 | 1.04 |
| 95-57-8 | 2-Chlorophenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 88-75-5 | 2-Nitrophenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.4 | ug/L | 3.11 | 10.4 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.4 | ug/L | 3.11 | 10.4 |
| 59-50-7 | Parachlorometa cresol | U | 10.4 | ug/L | 3.11 | 10.4 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.4 | ug/L | 3.42 | 10.4 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.4 | ug/L | 3.11 | 10.4 |
| 100-02-7 | 4-Nitrophenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 62-53-3 | Aniline | U | 10.4 | ug/L | 4.35 | 10.4 |
| 1912-24-9 | Atrazine | U | 10.4 | ug/L | 3.11 | 10.4 |
| 92-87-5 | Benzidine | U | 10.4 | ug/L | 4.04 | 10.4 |
| 65-85-0 | Benzoic acid | U | 20.7 | ug/L | 6.22 | 20.7 |
| 100-51-6 | Benzyl alcohol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 85-68-7 | Butylbenzylphthalate | U | 10.4 | ug/L | 3.11 | 10.4 |
| 84-74-2 | Di-n-butylphthalate | U | 10.4 | ug/L | 3.11 | 10.4 |
| 117-84-0 | Di-n-octylphthalate | U | 10.4 | ug/L | 3.11 | 10.4 |
| 132-64-9 | Dibenzofuran | U | 10.4 | ug/L | 3.11 | 10.4 |
| 84-66-2 | Diethylphthalate | U | 10.4 | ug/L | 3.11 | 10.4 |
| 131-11-3 | Dimethylphthalate | U | 10.4 | ug/L | 3.11 | 10.4 |
| 88-85-7 | Dinoseb | U | 10.4 | ug/L | 3.11 | 10.4 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951005** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 16:48** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **965 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2612.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.4 | ug/L | 3.11 | 10.4 |
| 87-68-3 | Hexachlorobutadiene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 67-72-1 | Hexachloroethane | U | 10.4 | ug/L | 3.11 | 10.4 |
| 78-59-1 | Isophorone | U | 10.4 | ug/L | 3.63 | 10.4 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.4 | ug/L | 3.11 | 10.4 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.4 | ug/L | 3.11 | 10.4 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.4 | ug/L | 3.11 | 10.4 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.4 | ug/L | 3.11 | 10.4 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.4 | ug/L | 3.11 | 10.4 |
| 98-95-3 | Nitrobenzene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 608-93-5 | Pentachlorobenzene | U | 10.4 | ug/L | 3.11 | 10.4 |
| 108-95-2 | Phenol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 110-86-1 | Pyridine | U | 10.4 | ug/L | 3.11 | 10.4 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.4 | ug/L | 3.11 | 10.4 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.4 | ug/L | 3.11 | 10.4 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.4 | ug/L | 3.11 | 10.4 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.4 | ug/L | 3.11 | 10.4 |
| 65794-96-9 | m,p-Cresols | U | 10.4 | ug/L | 3.83 | 10.4 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.4 | ug/L | 3.11 | 10.4 |
| 95-48-7 | o-Cresol | U | 10.4 | ug/L | 3.11 | 10.4 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.4 | ug/L | 3.11 | 10.4 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.4 | ug/L | 3.11 | 10.4 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 61.4 | 104 | ug/L | 59.3 | (26%-129%) |
| 2-Fluorobiphenyl | 31.2 | 51.8 | ug/L | 60.2 | (32%-102%) |
| 2-Fluorophenol | 41.0 | 104 | ug/L | 39.5 | (10%-78%) |
| Nitrobenzene-d5 | 32.8 | 51.8 | ug/L | 63.3 | (36%-125%) |
| Phenol-d5 | 25.7 | 104 | ug/L | 24.8 | (10%-104%) |
| p-Terphenyl-d14 | 38.0 | 51.8 | ug/L | 73.4 | (34%-135%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 1.958 | 28.4 | ug/L | 0 | J |
| | unknown | 2.001 | 6.24 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951005** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 16:48** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **965 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2612.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000994-05-8 | Butane, 2-methoxy-2-methyl- | 2.072 | 120 | ug/L | 90 | NJ |
| | unknown | 3.149 | 5.61 | ug/L | 0 | J |
| | unknown | 3.553 | 5.12 | ug/L | 0 | J |
| | unknown | 14.444 | 7.34 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951014** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 17:19** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **910 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2613.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 122-66-7 | Azobenzene | U | 11.0 | ug/L | 3.30 | 11.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 123-91-1 | 1,4-Dioxane | U | 11.0 | ug/L | 3.30 | 11.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 22.0 | ug/L | 5.49 | 22.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.10 | ug/L | 0.451 | 1.10 |
| 95-57-8 | 2-Chlorophenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 88-75-5 | 2-Nitrophenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 11.0 | ug/L | 3.30 | 11.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 11.0 | ug/L | 3.30 | 11.0 |
| 59-50-7 | Parachlorometa cresol | U | 11.0 | ug/L | 3.30 | 11.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 11.0 | ug/L | 3.63 | 11.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 11.0 | ug/L | 3.30 | 11.0 |
| 100-02-7 | 4-Nitrophenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 62-53-3 | Aniline | U | 11.0 | ug/L | 4.62 | 11.0 |
| 1912-24-9 | Atrazine | U | 11.0 | ug/L | 3.30 | 11.0 |
| 92-87-5 | Benzidine | U | 11.0 | ug/L | 4.29 | 11.0 |
| 65-85-0 | Benzoic acid | U | 22.0 | ug/L | 6.59 | 22.0 |
| 100-51-6 | Benzyl alcohol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 85-68-7 | Butylbenzylphthalate | U | 11.0 | ug/L | 3.30 | 11.0 |
| 84-74-2 | Di-n-butylphthalate | U | 11.0 | ug/L | 3.30 | 11.0 |
| 117-84-0 | Di-n-octylphthalate | U | 11.0 | ug/L | 3.30 | 11.0 |
| 132-64-9 | Dibenzofuran | U | 11.0 | ug/L | 3.30 | 11.0 |
| 84-66-2 | Diethylphthalate | U | 11.0 | ug/L | 3.30 | 11.0 |
| 131-11-3 | Dimethylphthalate | U | 11.0 | ug/L | 3.30 | 11.0 |
| 88-85-7 | Dinoseb | U | 11.0 | ug/L | 3.30 | 11.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951014** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 17:19** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **910 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2613.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 11.0 | ug/L | 3.30 | 11.0 |
| 87-68-3 | Hexachlorobutadiene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 67-72-1 | Hexachloroethane | U | 11.0 | ug/L | 3.30 | 11.0 |
| 78-59-1 | Isophorone | U | 11.0 | ug/L | 3.85 | 11.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 11.0 | ug/L | 3.30 | 11.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 11.0 | ug/L | 3.30 | 11.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 11.0 | ug/L | 3.30 | 11.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 11.0 | ug/L | 3.30 | 11.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 11.0 | ug/L | 3.30 | 11.0 |
| 98-95-3 | Nitrobenzene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 608-93-5 | Pentachlorobenzene | U | 11.0 | ug/L | 3.30 | 11.0 |
| 108-95-2 | Phenol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 110-86-1 | Pyridine | U | 11.0 | ug/L | 3.30 | 11.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 11.0 | ug/L | 3.30 | 11.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 11.0 | ug/L | 3.30 | 11.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 11.0 | ug/L | 3.30 | 11.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 11.0 | ug/L | 3.30 | 11.0 |
| 65794-96-9 | m,p-Cresols | U | 11.0 | ug/L | 4.07 | 11.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 11.0 | ug/L | 3.30 | 11.0 |
| 95-48-7 | o-Cresol | U | 11.0 | ug/L | 3.30 | 11.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 11.0 | ug/L | 3.30 | 11.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 11.0 | ug/L | 3.30 | 11.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 66.5 | 110 | ug/L | 60.5 | (26%-129%) |
| 2-Fluorobiphenyl | 35.6 | 54.9 | ug/L | 64.8 | (32%-102%) |
| 2-Fluorophenol | 47.9 | 110 | ug/L | 43.6 | (10%-78%) |
| Nitrobenzene-d5 | 37.6 | 54.9 | ug/L | 68.4 | (36%-125%) |
| Phenol-d5 | 30.4 | 110 | ug/L | 27.7 | (10%-104%) |
| p-Terphenyl-d14 | 45.1 | 54.9 | ug/L | 82.1 | (34%-135%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 1.958 | 31.5 | ug/L | 0 | J |
| | unknown | 2.001 | 6.56 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951014** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 17:19** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **910 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2613.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000994-05-8 | Butane, 2-methoxy-2-methyl- | 2.073 | 128 | ug/L | 90 | NJ |
| | unknown | 3.149 | 6.04 | ug/L | 0 | J |
| | unknown | 3.554 | 5.25 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951019** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 19:17** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2521.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 122-66-7 | Azobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 123-91-1 | 1,4-Dioxane | U | 10.9 | ug/L | 3.26 | 10.9 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 51-28-5 | 2,4-Dinitrophenol | U | 21.7 | ug/L | 5.43 | 21.7 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.09 | ug/L | 0.446 | 1.09 |
| 95-57-8 | 2-Chlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 88-75-5 | 2-Nitrophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.9 | ug/L | 3.26 | 10.9 |
| 59-50-7 | Parachlorometa cresol | U | 10.9 | ug/L | 3.26 | 10.9 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.9 | ug/L | 3.59 | 10.9 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.9 | ug/L | 3.26 | 10.9 |
| 100-02-7 | 4-Nitrophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 62-53-3 | Aniline | U | 10.9 | ug/L | 4.57 | 10.9 |
| 1912-24-9 | Atrazine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 92-87-5 | Benzidine | U | 10.9 | ug/L | 4.24 | 10.9 |
| 65-85-0 | Benzoic acid | U | 21.7 | ug/L | 6.52 | 21.7 |
| 100-51-6 | Benzyl alcohol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 85-68-7 | Butylbenzylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 84-74-2 | Di-n-butylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 117-84-0 | Di-n-octylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 132-64-9 | Dibenzofuran | U | 10.9 | ug/L | 3.26 | 10.9 |
| 84-66-2 | Diethylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 131-11-3 | Dimethylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 88-85-7 | Dinoseb | U | 10.9 | ug/L | 3.26 | 10.9 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951019** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 19:17** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2521.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 87-68-3 | Hexachlorobutadiene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 67-72-1 | Hexachloroethane | U | 10.9 | ug/L | 3.26 | 10.9 |
| 78-59-1 | Isophorone | U | 10.9 | ug/L | 3.80 | 10.9 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.9 | ug/L | 3.26 | 10.9 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 98-95-3 | Nitrobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 608-93-5 | Pentachlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 108-95-2 | Phenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 110-86-1 | Pyridine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.9 | ug/L | 3.26 | 10.9 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.9 | ug/L | 3.26 | 10.9 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.9 | ug/L | 3.26 | 10.9 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 65794-96-9 | m,p-Cresols | U | 10.9 | ug/L | 4.02 | 10.9 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.9 | ug/L | 3.26 | 10.9 |
| 95-48-7 | o-Cresol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.9 | ug/L | 3.26 | 10.9 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.9 | ug/L | 3.26 | 10.9 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 37.7 | 109 | ug/L | 34.7 | (26%-129%) |
| 2-Fluorobiphenyl | 34.5 | 54.3 | ug/L | 63.4 | (32%-102%) |
| 2-Fluorophenol | 46.4 | 109 | ug/L | 42.7 | (10%-78%) |
| Nitrobenzene-d5 | 33.8 | 54.3 | ug/L | 62.2 | (36%-125%) |
| Phenol-d5 | 28.8 | 109 | ug/L | 26.5 | (10%-104%) |
| p-Terphenyl-d14 | 51.3 | 54.3 | ug/L | 94.5 | (34%-135%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 1.977 | 27.8 | ug/L | 0 | J |
| | unknown | 2.016 | 7.09 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951019** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 19:17** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2521.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.087 | 117 | ug/L | 0 | J |
| | unknown | 3.173 | 6.23 | ug/L | 0 | J |
| | unknown | 3.582 | 5.09 | ug/L | 0 | J |
| | unknown | 13.435 | 6.07 | ug/L | 0 | J |
| | unknown | 18.33 | 22.8 | ug/L | 0 | J |
| | unknown | 22.925 | 75.4 | ug/L | 0 | J |

# Quality Control Summary

**Semi-Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-3574**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 2FP %REC | PHL %REC | NBZ %REC | FBP %REC | TBP %REC | TPH %REC |
|---|---|---|---|---|---|---|---|
| 1203114923 | MB for batch 1398263 | 41 | 25 | 62 | 48 | 54 | 79 |
| 1203114924 | LCS for batch 1398263 | 39 | 26 | 67 | 58 | 72 | 76 |
| 350951019 | CALA-14-79447 | 43 | 27 | 62 | 63 | 35 | 94 |
| 1203114925 | CALA-14-79460MS | 54 | 44 | 68 | 66 | 53 | 90 |
| 1203114926 | CALA-14-79460MSD | 56 | 45 | 70 | 64 | 58 | 91 |
| 350951005 | CALA-14-79458 | 40 | 25 | 63 | 60 | 59 | 73 |
| 350951014 | CALA-14-79446 | 44 | 28 | 68 | 65 | 61 | 82 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 2FP | = 2-Fluorophenol | (10%-78%) |
| PHL | = Phenol-d5 | (10%-104%) |
| NBZ | = Nitrobenzene-d5 | (36%-125%) |
| FBP | = 2-Fluorobiphenyl | (32%-102%) |
| TBP | = 2,4,6-Tribromophenol | (26%-129%) |
| TPH | = p-Terphenyl-d14 | (34%-135%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1398263**
**Lab Sample ID** **1203114924**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/25/2014 14:06**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 62-75-9 | LCS | N-Methyl-N-nitrosomethylam | 50.0 | 0.0 | 23.7 | 47 | 18-75 |
| 110-86-1 | LCS | Pyridine | 50.0 | 0.0 | 29.3 | 59 | 11-88 |
| 62-53-3 | LCS | Aniline | 50.0 | 0.0 | 39.0 | 78 | 35-107 |
| 108-95-2 | LCS | Phenol | 50.0 | 0.0 | 13.3 | 27 | 13-77 |
| 111-44-4 | LCS | bis(2-Chloroethyl) ether | 50.0 | 0.0 | 31.4 | 63 | 35-111 |
| 95-57-8 | LCS | 2-Chlorophenol | 50.0 | 0.0 | 30.9 | 62 | 39-99 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 15.3 | 31 | 25-100 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 15.9 | 32 | 24-88 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 16.8 | 34 | 27-87 |
| 108-60-1 | LCS | bis(2-Chloro-1-methylethyl)et | 50.0 | 0.0 | 29.9 | 60 | 23-120 |
| 100-51-6 | LCS | Benzyl alcohol | 50.0 | 0.0 | 29.8 | 60 | 33-90 |
| 95-48-7 | LCS | o-Cresol | 50.0 | 0.0 | 29.8 | 60 | 32-90 |
| 65794-96-9 | LCS | m,p-Cresols | 50.0 | 0.0 | 31.0 | 62 | 28-100 |
| 621-64-7 | LCS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 50.0 | 0.0 | 38.3 | 77 | 39-113 |
| 67-72-1 | LCS | Hexachloroethane | 50.0 | 0.0 | 15.1 | 30 | 20-85 |
| 98-95-3 | LCS | Nitrobenzene | 50.0 | 0.0 | 32.3 | 65 | 41-119 |
| 78-59-1 | LCS | Isophorone | 50.0 | 0.0 | 37.8 | 76 | 49-133 |
| 88-75-5 | LCS | 2-Nitrophenol | 50.0 | 0.0 | 31.2 | 62 | 42-111 |
| 105-67-9 | LCS | 2,4-Dimethylphenol | 50.0 | 0.0 | 33.0 | 66 | 43-99 |
| 111-91-1 | LCS | bis(2-Chloroethoxy)methane | 50.0 | 0.0 | 34.1 | 68 | 44-109 |
| 120-83-2 | LCS | 2,4-Dichlorophenol | 50.0 | 0.0 | 32.3 | 65 | 45-106 |
| 65-85-0 | LCS | Benzoic acid | 100 | 0.0 | 22.5 | 23 | 10-81 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1398263**
**Lab Sample ID** **1203114924**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/25/2014 14:06**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-47-8 | LCS | 4-Chloroaniline | 50.0 | 0.0 | 36.9 | 74 | 50-122 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 13.7 | 27 | 19-92 |
| 59-50-7 | LCS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 50.0 | 0.0 | 36.6 | 73 | 46-111 |
| 77-47-4 | LCS | Hexachlorocyclopentadiene | 50.0 | 0.0 | 11.7 | 23 | 15-72 |
| 88-06-2 | LCS | 2,4,6-Trichlorophenol | 50.0 | 0.0 | 35.7 | 71 | 41-109 |
| 95-95-4 | LCS | 2,4,5-Trichlorophenol | 50.0 | 0.0 | 34.1 | 68 | 41-111 |
| 91-58-7 | LCS | 2-Chloronaphthalene | 50.0 | 0.0 | 21.6 | 43 | 36-98 |
| 88-74-4 | LCS | 2-Nitroaniline<br>*o-Nitroaniline* | 50.0 | 0.0 | 38.2 | 76 | 44-117 |
| 99-09-2 | LCS | 3-Nitroaniline<br>*m-Nitroaniline* | 50.0 | 0.0 | 33.8 | 68 | 45-124 |
| 131-11-3 | LCS | Dimethylphthalate | 50.0 | 0.0 | 40.8 | 82 | 53-112 |
| 606-20-2 | LCS | 2,6-Dinitrotoluene | 50.0 | 0.0 | 37.7 | 75 | 52-117 |
| 121-14-2 | LCS | 2,4-Dinitrotoluene | 50.0 | 0.0 | 39.0 | 78 | 45-124 |
| 51-28-5 | LCS | 2,4-Dinitrophenol | 50.0 | 0.0 | 25.9 | 52 | 19-110 |
| 132-64-9 | LCS | Dibenzofuran | 50.0 | 0.0 | 29.6 | 59 | 45-107 |
| 58-90-2 | LCS | 2,3,4,6-Tetrachlorophenol | 50.0 | 0.0 | 35.9 | 72 | 45-120 |
| 84-66-2 | LCS | Diethylphthalate | 50.0 | 0.0 | 42.5 | 85 | 51-116 |
| 100-02-7 | LCS | 4-Nitrophenol | 50.0 | 0.0 | 7.55 | 15 * | 16-77 |
| 7005-72-3 | LCS | 4-Chlorophenylphenylether | 50.0 | 0.0 | 32.0 | 64 | 40-114 |
| 100-01-6 | LCS | 4-Nitroaniline<br>*p-Nitroaniline* | 50.0 | 0.0 | 32.3 | 65 | 38-133 |
| 534-52-1 | LCS | 2-Methyl-4,6-dinitrophenol | 50.0 | 0.0 | 34.8 | 70 | 34-114 |
| 122-39-4 | LCS | Diphenylamine | 50.0 | 0.0 | 33.5 | 67 | 47-111 |
| 122-66-7 | LCS | Azobenzene<br>*1,2-Diphenylhydrazine* | 50.0 | 0.0 | 38.9 | 78 | 40-112 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1398263**
**Lab Sample ID** **1203114924**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/25/2014 14:06**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 101-55-3 | LCS | 4-Bromophenylphenylether | 50.0 | 0.0 | 33.2 | 66 | 41-113 |
| 84-74-2 | LCS | Di-n-butylphthalate | 50.0 | 0.0 | 41.6 | 83 | 49-116 |
| 85-68-7 | LCS | Butylbenzylphthalate | 50.0 | 0.0 | 41.4 | 83 | 40-122 |
| 117-81-7 | LCS | bis(2-Ethylhexyl)phthalate | 50.0 | 0.0 | 41.8 | 84 | 37-124 |
| 117-84-0 | LCS | Di-n-octylphthalate | 50.0 | 0.0 | 44.6 | 89 | 33-122 |
| 123-91-1 | LCS | 1,4-Dioxane | 50.0 | 0.0 | 22.1 | 44 | 26-73 |
| 930-55-2 | LCS | N-Nitrosopyrrolidine | 50.0 | 0.0 | 36.5 | 73 | 42-106 |
| 95-94-3 | LCS | 1,2,4,5-Tetrachlorobenzene | 50.0 | 0.0 | 16.9 | 34 * | 36-95 |
| 1912-24-9 | LCS | Atrazine | 50.0 | 0.0 | 41.4 | 83 | 47-115 |
| 92-87-5 | LCS | Benzidine | 100 | 0.0 | 28.4 | 28 | 10-124 |
| 91-94-1 | LCS | 3,3'-Dichlorobenzidine | 50.0 | 0.0 | 36.0 | 72 | 31-113 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 15.8 | 32 | 26-92 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114925**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:19**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MS | N-Methyl-N-nitrosomethylam | 112 | 0.00 | U | 68.9 | 61 | 21-88 |
| 110-86-1 | MS | Pyridine | 112 | 0.00 | U | 71.8 | 64 | 14-94 |
| 62-53-3 | MS | Aniline | 112 | 0.00 | U | 87.7 | 78 | 24-109 |
| 108-95-2 | MS | Phenol | 112 | 0.00 | U | 61.1 | 54 | 10-88 |
| 111-44-4 | MS | bis(2-Chloroethyl) ether | 112 | 0.00 | U | 77.5 | 69 | 25-114 |
| 95-57-8 | MS | 2-Chlorophenol | 112 | 0.00 | U | 78.6 | 70 | 31-103 |
| 541-73-1 | MS | 1,3-Dichlorobenzene | 112 | 0.00 | U | 42.2 | 38 | 18-83 |
| 106-46-7 | MS | 1,4-Dichlorobenzene | 112 | 0.00 | U | 42.7 | 38 | 20-86 |
| 95-50-1 | MS | 1,2-Dichlorobenzene | 112 | 0.00 | U | 46.0 | 41 | 21-85 |
| 108-60-1 | MS | bis(2-Chloro-1-methylethyl)et | 112 | 0.00 | U | 74.1 | 66 | 16-121 |
| 100-51-6 | MS | Benzyl alcohol | 112 | 0.00 | U | 79.6 | 71 | 31-100 |
| 95-48-7 | MS | o-Cresol | 112 | 0.00 | U | 79.2 | 70 | 26-97 |
| 65794-96-9 | MS | m,p-Cresols | 112 | 0.00 | U | 87.1 | 78 | 24-110 |
| 621-64-7 | MS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 112 | 0.00 | U | 88.4 | 79 | 29-116 |
| 67-72-1 | MS | Hexachloroethane | 112 | 0.00 | U | 37.4 | 33 | 17-82 |
| 98-95-3 | MS | Nitrobenzene | 112 | 0.00 | U | 78.5 | 70 | 32-126 |
| 78-59-1 | MS | Isophorone | 112 | 0.00 | U | 85.7 | 76 | 36-139 |
| 88-75-5 | MS | 2-Nitrophenol | 112 | 0.00 | U | 75.9 | 68 | 29-117 |
| 105-67-9 | MS | 2,4-Dimethylphenol | 112 | 0.00 | U | 65.8 | 59 | 28-107 |
| 111-91-1 | MS | bis(2-Chloroethoxy)methane | 112 | 0.00 | U | 77.2 | 69 | 34-112 |
| 120-83-2 | MS | 2,4-Dichlorophenol | 112 | 0.00 | U | 68.9 | 61 | 34-111 |
| 65-85-0 | MS | Benzoic acid | 225 | 0.00 | U | 0.00 | 0 * | 10-105 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114925**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:19**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MS | 4-Chloroaniline | 112 | 0.00 | U | 82.0 | 73 | 28-123 |
| 87-68-3 | MS | Hexachlorobutadiene | 112 | 0.00 | U | 33.0 | 29 | 11-97 |
| 59-50-7 | MS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 112 | 0.00 | U | 72.9 | 65 | 31-119 |
| 77-47-4 | MS | Hexachlorocyclopentadiene | 112 | 0.00 | U | 0.00 | 0 * | 14-73 |
| 88-06-2 | MS | 2,4,6-Trichlorophenol | 112 | 0.00 | U | 77.0 | 69 | 31-113 |
| 95-95-4 | MS | 2,4,5-Trichlorophenol | 112 | 0.00 | U | 70.0 | 62 | 30-117 |
| 91-58-7 | MS | 2-Chloronaphthalene | 112 | 0.00 | U | 64.7 | 58 | 30-97 |
| 88-74-4 | MS | 2-Nitroaniline<br>*o-Nitroaniline* | 112 | 0.00 | U | 85.5 | 76 | 28-122 |
| 99-09-2 | MS | 3-Nitroaniline<br>*m-Nitroaniline* | 112 | 0.00 | U | 66.8 | 59 | 29-125 |
| 131-11-3 | MS | Dimethylphthalate | 112 | 0.00 | U | 93.2 | 83 | 41-116 |
| 606-20-2 | MS | 2,6-Dinitrotoluene | 112 | 0.00 | U | 84.3 | 75 | 40-123 |
| 121-14-2 | MS | 2,4-Dinitrotoluene | 112 | 0.00 | U | 85.2 | 76 | 34-126 |
| 51-28-5 | MS | 2,4-Dinitrophenol | 112 | 0.00 | U | 35.8 | 32 | 17-110 |
| 132-64-9 | MS | Dibenzofuran | 112 | 0.00 | U | 74.1 | 66 | 36-107 |
| 58-90-2 | MS | 2,3,4,6-Tetrachlorophenol | 112 | 0.00 | U | 53.8 | 48 | 29-126 |
| 84-66-2 | MS | Diethylphthalate | 112 | 0.00 | U | 89.4 | 80 | 41-117 |
| 100-02-7 | MS | 4-Nitrophenol | 112 | 0.00 | U | 0.00 | 0 * | 16-71 |
| 7005-72-3 | MS | 4-Chlorophenylphenylether | 112 | 0.00 | U | 73.8 | 66 | 30-112 |
| 100-01-6 | MS | 4-Nitroaniline<br>*p-Nitroaniline* | 112 | 0.00 | U | 59.9 | 53 | 25-133 |
| 534-52-1 | MS | 2-Methyl-4,6-dinitrophenol | 112 | 0.00 | U | 62.7 | 56 | 22-118 |
| 122-39-4 | MS | Diphenylamine | 112 | 0.00 | U | 84.9 | 76 | 34-111 |
| 122-66-7 | MS | Azobenzene<br>*1,2-Diphenylhydrazine* | 112 | 0.00 | U | 106 | 94 | 30-112 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114925**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:19**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MS | 4-Bromophenylphenylether | 112 | 0.00 | U | 91.0 | 81 | 32-111 |
| 84-74-2 | MS | Di-n-butylphthalate | 112 | 0.00 | U | 86.1 | 77 | 35-118 |
| 85-68-7 | MS | Butylbenzylphthalate | 112 | 0.00 | U | 90.5 | 81 | 29-121 |
| 117-81-7 | MS | bis(2-Ethylhexyl)phthalate | 112 | 0.00 | U | 94.3 | 84 | 29-120 |
| 117-84-0 | MS | Di-n-octylphthalate | 112 | 0.00 | U | 88.0 | 78 | 25-118 |
| 123-91-1 | MS | 1,4-Dioxane | 112 | 0.00 | U | 60.6 | 54 | 26-88 |
| 930-55-2 | MS | N-Nitrosopyrrolidine | 112 | 0.00 | U | 90.1 | 80 | 42-110 |
| 95-94-3 | MS | 1,2,4,5-Tetrachlorobenzene | 112 | 0.00 | U | 50.4 | 45 | 29-96 |
| 1912-24-9 | MS | Atrazine | 112 | 0.00 | U | 81.5 | 73 | 33-121 |
| 92-87-5 | MS | Benzidine | 225 | 0.00 | U | 37.2 | 17 | 10-117 |
| 91-94-1 | MS | 3,3'-Dichlorobenzidine | 112 | 0.00 | U | 86.0 | 77 | 22-111 |
| 120-82-1 | MS | 1,2,4-Trichlorobenzene | 112 | 0.00 | U | 44.2 | 39 | 20-90 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MSD**
**Lab Sample ID** **1203114926**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:50**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MSD | N-Methyl-N-nitrosomethylam | 112 | 0.00 | U | 68.3 | 61 | 21-88 | 1 | 0-30 |
| 110-86-1 | MSD | Pyridine | 112 | 0.00 | U | 79.0 | 70 | 14-94 | 10 | 0-30 |
| 62-53-3 | MSD | Aniline | 112 | 0.00 | U | 89.2 | 79 | 24-109 | 2 | 0-30 |
| 108-95-2 | MSD | Phenol | 112 | 0.00 | U | 60.8 | 54 | 10-88 | 1 | 0-30 |
| 111-44-4 | MSD | bis(2-Chloroethyl) ether | 112 | 0.00 | U | 76.7 | 68 | 25-114 | 1 | 0-30 |
| 95-57-8 | MSD | 2-Chlorophenol | 112 | 0.00 | U | 77.4 | 69 | 31-103 | 2 | 0-30 |
| 541-73-1 | MSD | 1,3-Dichlorobenzene | 112 | 0.00 | U | 36.4 | 32 | 18-83 | 15 | 0-30 |
| 106-46-7 | MSD | 1,4-Dichlorobenzene | 112 | 0.00 | U | 36.9 | 33 | 20-86 | 15 | 0-30 |
| 95-50-1 | MSD | 1,2-Dichlorobenzene | 112 | 0.00 | U | 39.6 | 35 | 21-85 | 15 | 0-30 |
| 108-60-1 | MSD | bis(2-Chloro-1-methylethyl)et | 112 | 0.00 | U | 70.2 | 62 | 16-121 | 5 | 0-30 |
| 100-51-6 | MSD | Benzyl alcohol | 112 | 0.00 | U | 77.6 | 69 | 31-100 | 3 | 0-30 |
| 95-48-7 | MSD | o-Cresol | 112 | 0.00 | U | 80.5 | 72 | 26-97 | 2 | 0-30 |
| 65794-96-9 | MSD | m,p-Cresols | 112 | 0.00 | U | 87.8 | 78 | 24-110 | 1 | 0-30 |
| 621-64-7 | MSD | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 112 | 0.00 | U | 90.1 | 80 | 29-116 | 2 | 0-30 |
| 67-72-1 | MSD | Hexachloroethane | 112 | 0.00 | U | 31.3 | 28 | 17-82 | 18 | 0-30 |
| 98-95-3 | MSD | Nitrobenzene | 112 | 0.00 | U | 76.9 | 68 | 32-126 | 2 | 0-30 |
| 78-59-1 | MSD | Isophorone | 112 | 0.00 | U | 86.9 | 77 | 36-139 | 1 | 0-30 |
| 88-75-5 | MSD | 2-Nitrophenol | 112 | 0.00 | U | 78.3 | 70 | 29-117 | 3 | 0-30 |
| 105-67-9 | MSD | 2,4-Dimethylphenol | 112 | 0.00 | U | 76.2 | 68 | 28-107 | 15 | 0-30 |
| 111-91-1 | MSD | bis(2-Chloroethoxy)methane | 112 | 0.00 | U | 78.9 | 70 | 34-112 | 2 | 0-30 |
| 120-83-2 | MSD | 2,4-Dichlorophenol | 112 | 0.00 | U | 72.9 | 65 | 34-111 | 6 | 0-30 |
| 65-85-0 | MSD | Benzoic acid | 225 | 0.00 | U | 0.00 | 0 * | 10-105 | 0 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MSD**
**Lab Sample ID** **1203114926**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:50**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MSD | 4-Chloroaniline | 112 | 0.00 | U | 82.0 | 73 | 28-123 | 0 | 0-30 |
| 87-68-3 | MSD | Hexachlorobutadiene | 112 | 0.00 | U | 27.1 | 24 | 11-97 | 19 | 0-30 |
| 59-50-7 | MSD | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 112 | 0.00 | U | 76.0 | 68 | 31-119 | 4 | 0-30 |
| 77-47-4 | MSD | Hexachlorocyclopentadiene | 112 | 0.00 | U | 0.00 | 0 * | 14-73 | 0 | 0-30 |
| 88-06-2 | MSD | 2,4,6-Trichlorophenol | 112 | 0.00 | U | 77.3 | 69 | 31-113 | 0 | 0-30 |
| 95-95-4 | MSD | 2,4,5-Trichlorophenol | 112 | 0.00 | U | 75.1 | 67 | 30-117 | 7 | 0-30 |
| 91-58-7 | MSD | 2-Chloronaphthalene | 112 | 0.00 | U | 57.9 | 52 | 30-97 | 11 | 0-30 |
| 88-74-4 | MSD | 2-Nitroaniline<br>*o-Nitroaniline* | 112 | 0.00 | U | 85.5 | 76 | 28-122 | 0 | 0-30 |
| 99-09-2 | MSD | 3-Nitroaniline<br>*m-Nitroaniline* | 112 | 0.00 | U | 73.9 | 66 | 29-125 | 10 | 0-30 |
| 131-11-3 | MSD | Dimethylphthalate | 112 | 0.00 | U | 89.5 | 80 | 41-116 | 4 | 0-30 |
| 606-20-2 | MSD | 2,6-Dinitrotoluene | 112 | 0.00 | U | 83.8 | 75 | 40-123 | 1 | 0-30 |
| 121-14-2 | MSD | 2,4-Dinitrotoluene | 112 | 0.00 | U | 83.2 | 74 | 34-126 | 2 | 0-30 |
| 51-28-5 | MSD | 2,4-Dinitrophenol | 112 | 0.00 | U | 39.3 | 35 | 17-110 | 9 | 0-30 |
| 132-64-9 | MSD | Dibenzofuran | 112 | 0.00 | U | 68.6 | 61 | 36-107 | 8 | 0-30 |
| 58-90-2 | MSD | 2,3,4,6-Tetrachlorophenol | 112 | 0.00 | U | 56.7 | 50 | 29-126 | 5 | 0-30 |
| 84-66-2 | MSD | Diethylphthalate | 112 | 0.00 | U | 87.7 | 78 | 41-117 | 2 | 0-30 |
| 100-02-7 | MSD | 4-Nitrophenol | 112 | 0.00 | U | 0.00 | 0 * | 16-71 | 0 | 0-30 |
| 7005-72-3 | MSD | 4-Chlorophenylphenylether | 112 | 0.00 | U | 71.0 | 63 | 30-112 | 4 | 0-30 |
| 100-01-6 | MSD | 4-Nitroaniline<br>*p-Nitroaniline* | 112 | 0.00 | U | 64.9 | 58 | 25-133 | 8 | 0-30 |
| 534-52-1 | MSD | 2-Methyl-4,6-dinitrophenol | 112 | 0.00 | U | 65.3 | 58 | 22-118 | 4 | 0-30 |
| 122-39-4 | MSD | Diphenylamine | 112 | 0.00 | U | 83.9 | 75 | 34-111 | 1 | 0-30 |
| 122-66-7 | MSD | Azobenzene<br>*1,2-Diphenylhydrazine* | 112 | 0.00 | U | 99.7 | 89 | 30-112 | 6 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MSD**
**Lab Sample ID** **1203114926**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:50**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MSD | 4-Bromophenylphenylether | 112 | 0.00 | U | 83.8 | 75 | 32-111 | 8 | 0-30 |
| 84-74-2 | MSD | Di-n-butylphthalate | 112 | 0.00 | U | 88.2 | 79 | 35-118 | 2 | 0-30 |
| 85-68-7 | MSD | Butylbenzylphthalate | 112 | 0.00 | U | 91.2 | 81 | 29-121 | 1 | 0-30 |
| 117-81-7 | MSD | bis(2-Ethylhexyl)phthalate | 112 | 0.00 | U | 91.9 | 82 | 29-120 | 3 | 0-30 |
| 117-84-0 | MSD | Di-n-octylphthalate | 112 | 0.00 | U | 82.7 | 74 | 25-118 | 6 | 0-30 |
| 123-91-1 | MSD | 1,4-Dioxane | 112 | 0.00 | U | 63.4 | 56 | 26-88 | 4 | 0-30 |
| 930-55-2 | MSD | N-Nitrosopyrrolidine | 112 | 0.00 | U | 86.7 | 77 | 42-110 | 4 | 0-30 |
| 95-94-3 | MSD | 1,2,4,5-Tetrachlorobenzene | 112 | 0.00 | U | 44.1 | 39 | 29-96 | 14 | 0-30 |
| 1912-24-9 | MSD | Atrazine | 112 | 0.00 | U | 82.2 | 73 | 33-121 | 1 | 0-30 |
| 92-87-5 | MSD | Benzidine | 225 | 0.00 | U | 72.5 | 32 | 10-117 | 64 * | 0-30 |
| 91-94-1 | MSD | 3,3'-Dichlorobenzidine | 112 | 0.00 | U | 76.9 | 68 | 22-111 | 11 | 0-30 |
| 120-82-1 | MSD | 1,2,4-Trichlorobenzene | 112 | 0.00 | U | 36.0 | 32 | 20-90 | 20 | 0-30 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1398263** | **Instrument ID:** | **MSD5.I** | **Data File:** | **s062514.b\s5F2510.D** |
| **Lab Sample ID:** | **1203114923** | **Prep Date:** | **06/24/2014 15:20** | **Analyzed:** | **06/25/14 13:35** |
| **Column:** | **DB-5ms** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1398263 | 1203114924 | s062514.b\s5F2511.D | 06/25/14 | 1406 |
| 02 CALA-14-79447 | 350951019 | s062514.b\s5F2521.D | 06/25/14 | 1917 |
| 03 CALA-14-79460MS | 1203114925 | s062514.b\s5F2523.D | 06/25/14 | 2019 |
| 04 CALA-14-79460MSD | 1203114926 | s062514.b\s5F2524.D | 06/25/14 | 2050 |
| 05 CALA-14-79458 | 350951005 | s062614.b\s5F2612.D | 06/26/14 | 1648 |
| 06 CALA-14-79446 | 350951014 | s062614.b\s5F2613.D | 06/26/14 | 1719 |

# Quality Control Data

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114923** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 13:35** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114923** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 13:35** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 53.9 | 100 | ug/L | 53.9 | (26%-129%) |
| 2-Fluorobiphenyl | 23.9 | 50.0 | ug/L | 47.7 | (32%-102%) |
| 2-Fluorophenol | 41.2 | 100 | ug/L | 41.2 | (10%-78%) |
| Nitrobenzene-d5 | 30.8 | 50.0 | ug/L | 61.6 | (36%-125%) |
| Phenol-d5 | 24.9 | 100 | ug/L | 24.9 | (10%-104%) |
| p-Terphenyl-d14 | 39.5 | 50.0 | ug/L | 79.1 | (34%-135%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 1.982 | 29.4 | ug/L | 0 | J |
| | unknown | 2.025 | 6.92 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114923** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 13:35** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000994-05-8 | Butane, 2-methoxy-2-methyl- | 2.096 | 122 | ug/L | 90 | NJ |
| | unknown | 3.177 | 6.25 | ug/L | 0 | J |
| | unknown | 3.587 | 5.54 | ug/L | 0 | J |
| | unknown | 17.049 | 4.28 | ug/L | 0 | J |
| | unknown | 22.963 | 32.6 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114924** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 14:06** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2511.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 16.9 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 15.8 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 16.8 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | | 38.9 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 15.3 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 15.9 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | | 22.1 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 35.9 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 34.1 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 35.7 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 32.3 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 33.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 25.9 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 39.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 37.7 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | | 21.6 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | | 30.9 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 34.8 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | | 31.2 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 36.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 33.2 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | | 36.6 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 36.9 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 32.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | J | 7.55 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | | 39.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | | 41.4 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | | 28.4 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | | 22.5 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | | 29.8 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | | 41.4 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | | 41.6 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | | 44.6 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | | 29.6 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | | 42.5 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | | 40.8 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114924** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 14:06** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2511.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 33.5 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | | 13.7 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 11.7 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | | 15.1 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | | 37.8 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 23.7 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 38.3 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 36.5 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | | 32.3 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | | 13.3 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | | 29.3 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 29.9 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 34.1 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 31.4 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 41.8 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | | 31.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 33.8 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | | 29.8 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 38.2 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 32.3 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 72.5 | 100 | ug/L | 72.5 | (26%-129%) |
| 2-Fluorobiphenyl | 29.0 | 50.0 | ug/L | 57.9 | (32%-102%) |
| 2-Fluorophenol | 38.9 | 100 | ug/L | 38.9 | (10%-78%) |
| Nitrobenzene-d5 | 33.4 | 50.0 | ug/L | 66.8 | (36%-125%) |
| Phenol-d5 | 25.5 | 100 | ug/L | 25.5 | (10%-104%) |
| p-Terphenyl-d14 | 38.2 | 50.0 | ug/L | 76.3 | (34%-135%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114925** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 20:19** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **445 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2523.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 50.4 | ug/L | 6.74 | 22.5 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 44.2 | ug/L | 6.74 | 22.5 |
| 95-50-1 | 1,2-Dichlorobenzene | | 46.0 | ug/L | 6.74 | 22.5 |
| 122-66-7 | Azobenzene | | 106 | ug/L | 6.74 | 22.5 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 42.2 | ug/L | 6.74 | 22.5 |
| 106-46-7 | 1,4-Dichlorobenzene | | 42.7 | ug/L | 6.74 | 22.5 |
| 123-91-1 | 1,4-Dioxane | | 60.6 | ug/L | 6.74 | 22.5 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 53.8 | ug/L | 6.74 | 22.5 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 70.0 | ug/L | 6.74 | 22.5 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 77.0 | ug/L | 6.74 | 22.5 |
| 120-83-2 | 2,4-Dichlorophenol | | 68.9 | ug/L | 6.74 | 22.5 |
| 105-67-9 | 2,4-Dimethylphenol | | 65.8 | ug/L | 6.74 | 22.5 |
| 51-28-5 | 2,4-Dinitrophenol | J | 35.8 | ug/L | 11.2 | 44.9 |
| 121-14-2 | 2,4-Dinitrotoluene | | 85.2 | ug/L | 6.74 | 22.5 |
| 606-20-2 | 2,6-Dinitrotoluene | | 84.3 | ug/L | 6.74 | 22.5 |
| 91-58-7 | 2-Chloronaphthalene | | 64.7 | ug/L | 0.921 | 2.25 |
| 95-57-8 | 2-Chlorophenol | | 78.6 | ug/L | 6.74 | 22.5 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 62.7 | ug/L | 6.74 | 22.5 |
| 88-75-5 | 2-Nitrophenol | | 75.9 | ug/L | 6.74 | 22.5 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 86.0 | ug/L | 6.74 | 22.5 |
| 101-55-3 | 4-Bromophenylphenylether | | 91.0 | ug/L | 6.74 | 22.5 |
| 59-50-7 | Parachlorometa cresol | | 72.9 | ug/L | 6.74 | 22.5 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 82.0 | ug/L | 7.42 | 22.5 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 73.8 | ug/L | 6.74 | 22.5 |
| 100-02-7 | 4-Nitrophenol | U | 22.5 | ug/L | 6.74 | 22.5 |
| 62-53-3 | Aniline | | 87.7 | ug/L | 9.44 | 22.5 |
| 1912-24-9 | Atrazine | | 81.5 | ug/L | 6.74 | 22.5 |
| 92-87-5 | Benzidine | | 37.2 | ug/L | 8.76 | 22.5 |
| 65-85-0 | Benzoic acid | U | 44.9 | ug/L | 13.5 | 44.9 |
| 100-51-6 | Benzyl alcohol | | 79.6 | ug/L | 6.74 | 22.5 |
| 85-68-7 | Butylbenzylphthalate | | 90.5 | ug/L | 6.74 | 22.5 |
| 84-74-2 | Di-n-butylphthalate | | 86.1 | ug/L | 6.74 | 22.5 |
| 117-84-0 | Di-n-octylphthalate | | 88.0 | ug/L | 6.74 | 22.5 |
| 132-64-9 | Dibenzofuran | | 74.1 | ug/L | 6.74 | 22.5 |
| 84-66-2 | Diethylphthalate | | 89.4 | ug/L | 6.74 | 22.5 |
| 131-11-3 | Dimethylphthalate | | 93.2 | ug/L | 6.74 | 22.5 |
| 88-85-7 | Dinoseb | U | 22.5 | ug/L | 6.74 | 22.5 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114925** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 20:19** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **445 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2523.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 84.9 | ug/L | 6.74 | 22.5 |
| 87-68-3 | Hexachlorobutadiene | | 33.0 | ug/L | 6.74 | 22.5 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 22.5 | ug/L | 6.74 | 22.5 |
| 67-72-1 | Hexachloroethane | | 37.4 | ug/L | 6.74 | 22.5 |
| 78-59-1 | Isophorone | | 85.7 | ug/L | 7.87 | 22.5 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 68.9 | ug/L | 6.74 | 22.5 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 22.5 | ug/L | 6.74 | 22.5 |
| 55-18-5 | N-Nitrosodiethylamine | U | 22.5 | ug/L | 6.74 | 22.5 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 88.4 | ug/L | 6.74 | 22.5 |
| 930-55-2 | N-Nitrosopyrrolidine | | 90.1 | ug/L | 6.74 | 22.5 |
| 98-95-3 | Nitrobenzene | | 78.5 | ug/L | 6.74 | 22.5 |
| 608-93-5 | Pentachlorobenzene | U | 22.5 | ug/L | 6.74 | 22.5 |
| 108-95-2 | Phenol | | 61.1 | ug/L | 6.74 | 22.5 |
| 110-86-1 | Pyridine | | 71.8 | ug/L | 6.74 | 22.5 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 74.1 | ug/L | 6.74 | 22.5 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 77.2 | ug/L | 6.74 | 22.5 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 77.5 | ug/L | 6.74 | 22.5 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 94.3 | ug/L | 6.74 | 22.5 |
| 65794-96-9 | m,p-Cresols | | 87.1 | ug/L | 8.31 | 22.5 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 66.8 | ug/L | 6.74 | 22.5 |
| 95-48-7 | o-Cresol | | 79.2 | ug/L | 6.74 | 22.5 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 85.5 | ug/L | 6.74 | 22.5 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 59.9 | ug/L | 6.74 | 22.5 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 119 | 225 | ug/L | 52.8 | (26%-129%) |
| 2-Fluorobiphenyl | 74.7 | 112 | ug/L | 66.4 | (32%-102%) |
| 2-Fluorophenol | 122 | 225 | ug/L | 54.2 | (10%-78%) |
| Nitrobenzene-d5 | 76.9 | 112 | ug/L | 68.5 | (36%-125%) |
| Phenol-d5 | 99.3 | 225 | ug/L | 44.2 | (10%-104%) |
| p-Terphenyl-d14 | 101 | 112 | ug/L | 90.1 | (34%-135%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114926** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 20:50** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **445 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2524.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 44.1 | ug/L | 6.74 | 22.5 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 36.0 | ug/L | 6.74 | 22.5 |
| 95-50-1 | 1,2-Dichlorobenzene | | 39.6 | ug/L | 6.74 | 22.5 |
| 122-66-7 | Azobenzene | | 99.7 | ug/L | 6.74 | 22.5 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 36.4 | ug/L | 6.74 | 22.5 |
| 106-46-7 | 1,4-Dichlorobenzene | | 36.9 | ug/L | 6.74 | 22.5 |
| 123-91-1 | 1,4-Dioxane | | 63.4 | ug/L | 6.74 | 22.5 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 56.7 | ug/L | 6.74 | 22.5 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 75.1 | ug/L | 6.74 | 22.5 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 77.3 | ug/L | 6.74 | 22.5 |
| 120-83-2 | 2,4-Dichlorophenol | | 72.9 | ug/L | 6.74 | 22.5 |
| 105-67-9 | 2,4-Dimethylphenol | | 76.2 | ug/L | 6.74 | 22.5 |
| 51-28-5 | 2,4-Dinitrophenol | J | 39.3 | ug/L | 11.2 | 44.9 |
| 121-14-2 | 2,4-Dinitrotoluene | | 83.2 | ug/L | 6.74 | 22.5 |
| 606-20-2 | 2,6-Dinitrotoluene | | 83.8 | ug/L | 6.74 | 22.5 |
| 91-58-7 | 2-Chloronaphthalene | | 57.9 | ug/L | 0.921 | 2.25 |
| 95-57-8 | 2-Chlorophenol | | 77.4 | ug/L | 6.74 | 22.5 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 65.3 | ug/L | 6.74 | 22.5 |
| 88-75-5 | 2-Nitrophenol | | 78.3 | ug/L | 6.74 | 22.5 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 76.9 | ug/L | 6.74 | 22.5 |
| 101-55-3 | 4-Bromophenylphenylether | | 83.8 | ug/L | 6.74 | 22.5 |
| 59-50-7 | Parachlorometa cresol | | 76.0 | ug/L | 6.74 | 22.5 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 82.0 | ug/L | 7.42 | 22.5 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 71.0 | ug/L | 6.74 | 22.5 |
| 100-02-7 | 4-Nitrophenol | U | 22.5 | ug/L | 6.74 | 22.5 |
| 62-53-3 | Aniline | | 89.2 | ug/L | 9.44 | 22.5 |
| 1912-24-9 | Atrazine | | 82.2 | ug/L | 6.74 | 22.5 |
| 92-87-5 | Benzidine | | 72.5 | ug/L | 8.76 | 22.5 |
| 65-85-0 | Benzoic acid | U | 44.9 | ug/L | 13.5 | 44.9 |
| 100-51-6 | Benzyl alcohol | | 77.6 | ug/L | 6.74 | 22.5 |
| 85-68-7 | Butylbenzylphthalate | | 91.2 | ug/L | 6.74 | 22.5 |
| 84-74-2 | Di-n-butylphthalate | | 88.2 | ug/L | 6.74 | 22.5 |
| 117-84-0 | Di-n-octylphthalate | | 82.7 | ug/L | 6.74 | 22.5 |
| 132-64-9 | Dibenzofuran | | 68.6 | ug/L | 6.74 | 22.5 |
| 84-66-2 | Diethylphthalate | | 87.7 | ug/L | 6.74 | 22.5 |
| 131-11-3 | Dimethylphthalate | | 89.5 | ug/L | 6.74 | 22.5 |
| 88-85-7 | Dinoseb | U | 22.5 | ug/L | 6.74 | 22.5 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114926** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 20:50** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **445 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2524.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 83.9 | ug/L | 6.74 | 22.5 |
| 87-68-3 | Hexachlorobutadiene | | 27.1 | ug/L | 6.74 | 22.5 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 22.5 | ug/L | 6.74 | 22.5 |
| 67-72-1 | Hexachloroethane | | 31.3 | ug/L | 6.74 | 22.5 |
| 78-59-1 | Isophorone | | 86.9 | ug/L | 7.87 | 22.5 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 68.3 | ug/L | 6.74 | 22.5 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 22.5 | ug/L | 6.74 | 22.5 |
| 55-18-5 | N-Nitrosodiethylamine | U | 22.5 | ug/L | 6.74 | 22.5 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 90.1 | ug/L | 6.74 | 22.5 |
| 930-55-2 | N-Nitrosopyrrolidine | | 86.7 | ug/L | 6.74 | 22.5 |
| 98-95-3 | Nitrobenzene | | 76.9 | ug/L | 6.74 | 22.5 |
| 608-93-5 | Pentachlorobenzene | U | 22.5 | ug/L | 6.74 | 22.5 |
| 108-95-2 | Phenol | | 60.8 | ug/L | 6.74 | 22.5 |
| 110-86-1 | Pyridine | | 79.0 | ug/L | 6.74 | 22.5 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 70.2 | ug/L | 6.74 | 22.5 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 78.9 | ug/L | 6.74 | 22.5 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 76.7 | ug/L | 6.74 | 22.5 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 91.9 | ug/L | 6.74 | 22.5 |
| 65794-96-9 | m,p-Cresols | | 87.8 | ug/L | 8.31 | 22.5 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 73.9 | ug/L | 6.74 | 22.5 |
| 95-48-7 | o-Cresol | | 80.5 | ug/L | 6.74 | 22.5 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 85.5 | ug/L | 6.74 | 22.5 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 64.9 | ug/L | 6.74 | 22.5 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 130 | 225 | ug/L | 57.7 | (26%-129%) |
| 2-Fluorobiphenyl | 71.8 | 112 | ug/L | 63.9 | (32%-102%) |
| 2-Fluorophenol | 125 | 225 | ug/L | 55.8 | (10%-78%) |
| Nitrobenzene-d5 | 79.0 | 112 | ug/L | 70.3 | (36%-125%) |
| Phenol-d5 | 101 | 225 | ug/L | 44.9 | (10%-104%) |
| p-Terphenyl-d14 | 102 | 112 | ug/L | 90.8 | (34%-135%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 27-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| SEMIVOA GC/MS | SW846 3510C/8270D | Liquid | ARSL (ESHL) |
| **Batch ID:** | **Sample Numbers:** | | |
| 1398264 | See Below | | |

**Potentially affected work order(s)(SDG): 350951(2014-3574),351059(2014-3584)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The 1203114924LCS recovered 4-Nitrophenol at 15.1%(limits are 16-77%) and 1,2,4,5-Tetracholrobenzene at 33.8% (limits are 36-95%). | 1. These failures are less than 5% of the total requested analytes. The data are reported. |
| 2. The 1203114925MS recovered 4-Nitrophenol at 0% (limits are 16-71%), Hexachlorocyclopentadiene at 0% (limits are 14-73%) and Benzoic acid at 0% (limits are 10-105%). | 2. & 3. The MS and MSD recovered the spikes in a similar manner. The failures are attributed to matrix interference. The data are reported. |
| 3. The 1203114926MSD recovered 4-Nitrophenol at 0% (limits are 16-71%), Hexachlorocyclopentadiene at 0% (limits are 14-73%) and Benzoic acid at 0% (limits are 10-105%). | |
| 4. The RPD value between the 1203114925MS and 1203114926MSD was not within the 0-30% limits for Benzidine at 64.3%. | 4. This failure is attributed to matrix interference. The data are reported. |

**Originator's Name:**

Richard Bomar 27-JUN-14

**Data Validator/Group Leader:**

Herbert Maier 27-JUN-14

# HPLC Polynuclear Aromatic Hydrocarbon Analysis

**HPLC-PAH**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Polynuclear Aromatic Hydrocarbons** |
| Analytical Method: | SW846 8310 |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1398214 |
| Prep Batch Number: | 1398212 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

| Sample ID | Client ID |
|---|---|
| 350951003 | CALA-14-79458 |
| 350951011 | CALA-14-79446 |
| 350951017 | CALA-14-79447 |
| 1203114810 | Method Blank (MB) |
| 1203114811 | Laboratory Control Sample (LCS) |
| 1203114812 | 351059003(CALA-14-79460) Matrix Spike (MS) |
| 1203114813 | 351059003(CALA-14-79460) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

## Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**CCV Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 351059003 (CALA-14-79460) from SDG 2014-3584 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
The second bottle for sample 351059003 (CALA-14-79460) was split into two equal volumes of 440 ml for purpose of extracting and analyzing a MS/MSD set. The spike aliquot was adjusted accordingly.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

**Additional Comments**
The Form 8 is used only as a sequence of the analysis.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the analyst, reviewer, and report specialist names associated with the generation of the data and package. The data validator will always sign and date the case narrative.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

**Chromatographic Columns**

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 09 JUL 2014**  **Title: Group Leader**

# Roadmap for ARSL 2014-3574 HPLC_PAH

This roadmap was analyzed by cww on 07-08-2014, 15:03.
This roadmap was reviewed by map on 07-08-2014, 16:18.
This roadmap was packaged by map on 07-09-2014, 10:03.

Sample

| exclude | manual | datafile | smpid | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3006.d | 350951003 | 30-JUN-2014 | 12:45 | 2014-3574.sub | CALA-14-79458 | 1 | 1398214 | |
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3007.d | 350951011 | 30-JUN-2014 | 13:27 | 2014-3574.sub | CALA-14-79446 | 1 | 1398214 | |
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3008.d | 350951017 | 30-JUN-2014 | 14:09 | 2014-3574.sub | CALA-14-79447 | 1 | 1398214 | |

QC Sample

| exclude | manual | datafile | smpid | sampletype | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3004.d | 1203114810 | mb | 30-JUN-2014 | 11:21 | 2014-3574.sub | PAHBLK01 | 1 | 1398214 | |
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3005.d | 1203114811 | lcs | 30-JUN-2014 | 12:03 | 2014-3574.sub | PAHBLK01LCS | 1 | 1398214 | Pass |

# Sample Data Summary

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951003** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 12:45** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5f3006.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.521 | ug/L | 0.227 | 0.521 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 83-32-9 | Acenaphthene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 208-96-8 | Acenaphthylene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 120-12-7 | Anthracene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.026 | ug/L | 0.00833 | 0.026 |
| 218-01-9 | Chrysene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 206-44-0 | Fluoranthene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 86-73-7 | Fluorene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 91-20-3 | Naphthalene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 85-01-8 | Phenanthrene | U | 0.521 | ug/L | 0.190 | 0.521 |
| 129-00-0 | Pyrene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 89.1 | 260 | ug/L | 34.2 | (21%-96%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951011** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 13:27** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **930 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5f3007.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.538 | ug/L | 0.234 | 0.538 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 83-32-9 | Acenaphthene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 208-96-8 | Acenaphthylene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 120-12-7 | Anthracene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.0269 | ug/L | 0.0086 | 0.0269 |
| 218-01-9 | Chrysene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 206-44-0 | Fluoranthene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 86-73-7 | Fluorene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 91-20-3 | Naphthalene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 85-01-8 | Phenanthrene | U | 0.538 | ug/L | 0.196 | 0.538 |
| 129-00-0 | Pyrene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 152 | 269 | ug/L | 56.4 | (21%-96%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951017** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 14:09** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **980 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5f3008.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.510 | ug/L | 0.222 | 0.510 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.510 | ug/L | 0.153 | 0.510 |
| 83-32-9 | Acenaphthene | U | 0.510 | ug/L | 0.153 | 0.510 |
| 208-96-8 | Acenaphthylene | U | 0.510 | ug/L | 0.153 | 0.510 |
| 120-12-7 | Anthracene | U | 0.510 | ug/L | 0.153 | 0.510 |
| 56-55-3 | Benzo(a)anthracene | U | 0.051 | ug/L | 0.0163 | 0.051 |
| 50-32-8 | Benzo(a)pyrene | U | 0.051 | ug/L | 0.0163 | 0.051 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.051 | ug/L | 0.0163 | 0.051 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.051 | ug/L | 0.0163 | 0.051 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.0255 | ug/L | 0.00816 | 0.0255 |
| 218-01-9 | Chrysene | U | 0.051 | ug/L | 0.0163 | 0.051 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.051 | ug/L | 0.0163 | 0.051 |
| 206-44-0 | Fluoranthene | U | 0.051 | ug/L | 0.0163 | 0.051 |
| 86-73-7 | Fluorene | U | 0.510 | ug/L | 0.153 | 0.510 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.051 | ug/L | 0.0163 | 0.051 |
| 91-20-3 | Naphthalene | U | 0.510 | ug/L | 0.153 | 0.510 |
| 85-01-8 | Phenanthrene | U | 0.510 | ug/L | 0.186 | 0.510 |
| 129-00-0 | Pyrene | U | 0.051 | ug/L | 0.0163 | 0.051 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 65.6 | 255 | ug/L | 25.7 | (21%-96%) |

# QC Summary

**PAH by HPLC**

**Surrogate Recovery Report**

**SDG Number: 2014-3574**

**Matrix Type: LIQUID**

**PACK Column (1) : C-18, DAD/FLD**

| Sample ID | Client ID | DFBF %REC |
|---|---|---|
| 1203114810 | MB for batch 1398212 | 70 |
| 1203114811 | LCS for batch 1398212 | 67 |
| 350951003 | CALA-14-79458 | 34 |
| 350951011 | CALA-14-79446 | 56 |
| 350951017 | CALA-14-79447 | 26 |
| 1203114812 | CALA-14-79460MS | 49 |
| 1203114813 | CALA-14-79460MSD | 53 |

| Surrogate | Acceptance Limits |
|---|---|
| DFBF = Decafluorobiphenyl | (21%-96%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1398212**
**Lab Sample ID** **1203114811**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/30/2014 12:03**
**Dilution: 1**
**Prep Batch ID:** **1398212**
**Batch ID:** **1398214**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 39.9 | 80 | 54-108 |
| 91-57-6 | LCS | 2-Methylnaphthalene | 50.0 | 0.0 | 45.3 | 91 | 50-91 |
| 90-12-0 | LCS | 1-Methylnaphthalene | 50.0 | 0.0 | 42.7 | 85 | 55-96 |
| 208-96-8 | LCS | Acenaphthylene | 50.0 | 0.0 | 43.2 | 86 | 52-100 |
| 83-32-9 | LCS | Acenaphthene | 50.0 | 0.0 | 46.2 | 92 | 53-107 |
| 86-73-7 | LCS | Fluorene | 50.0 | 0.0 | 44.6 | 89 | 62-130 |
| 85-01-8 | LCS | Phenanthrene | 50.0 | 0.0 | 43.9 | 88 | 69-130 |
| 120-12-7 | LCS | Anthracene | 50.0 | 0.0 | 47.2 | 94 | 70-130 |
| 206-44-0 | LCS | Fluoranthene | 5.00 | 0.0 | 4.24 | 85 | 70-130 |
| 129-00-0 | LCS | Pyrene | 5.00 | 0.0 | 4.44 | 89 | 70-130 |
| 56-55-3 | LCS | Benzo(a)anthracene | 5.00 | 0.0 | 4.43 | 89 | 70-130 |
| 218-01-9 | LCS | Chrysene | 5.00 | 0.0 | 4.71 | 94 | 70-130 |
| 205-99-2 | LCS | Benzo(b)fluoranthene | 5.00 | 0.0 | 4.38 | 88 | 70-130 |
| 207-08-9 | LCS | Benzo(k)fluoranthene | 2.50 | 0.0 | 2.35 | 94 | 70-130 |
| 50-32-8 | LCS | Benzo(a)pyrene | 5.00 | 0.0 | 4.49 | 90 | 70-130 |
| 193-39-5 | LCS | Indeno(1,2,3-cd)pyrene | 5.00 | 0.0 | 4.59 | 92 | 57-114 |
| 53-70-3 | LCS | Dibenzo(a,h)anthracene | 5.00 | 0.0 | 4.57 | 91 | 30-118 |
| 191-24-2 | LCS | Benzo(ghi)perylene | 5.00 | 0.0 | 3.85 | 77 | 42-115 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114812**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/30/2014 15:34**
**Prep Batch ID:** **1398212**
**Batch ID:** **1398214**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 91-20-3 | MS | Naphthalene | 56.8 | 0.00 | U | 33.1 | 58 | 32-104 |
| 91-57-6 | MS | 2-Methylnaphthalene | 56.8 | 0.00 | U | 38.4 | 68 | 56-130 |
| 90-12-0 | MS | 1-Methylnaphthalene | 56.8 | 0.00 | U | 35.4 | 62 | 46-130 |
| 208-96-8 | MS | Acenaphthylene | 56.8 | 0.00 | U | 36.0 | 63 | 26-121 |
| 83-32-9 | MS | Acenaphthene | 56.8 | 0.00 | U | 38.7 | 68 | 27-118 |
| 86-73-7 | MS | Fluorene | 56.8 | 0.00 | U | 39.8 | 70 | 29-123 |
| 85-01-8 | MS | Phenanthrene | 56.8 | 0.00 | U | 40.7 | 72 | 35-126 |
| 120-12-7 | MS | Anthracene | 56.8 | 0.00 | U | 45.4 | 80 | 36-122 |
| 206-44-0 | MS | Fluoranthene | 5.68 | 0.00 | U | 4.00 | 70 | 32-134 |
| 129-00-0 | MS | Pyrene | 5.68 | 0.00 | U | 4.21 | 74 | 32-134 |
| 56-55-3 | MS | Benzo(a)anthracene | 5.68 | 0.00 | U | 4.20 | 74 | 35-129 |
| 218-01-9 | MS | Chrysene | 5.68 | 0.00 | U | 4.51 | 79 | 25-141 |
| 205-99-2 | MS | Benzo(b)fluoranthene | 5.68 | 0.00 | U | 4.18 | 74 | 29-133 |
| 207-08-9 | MS | Benzo(k)fluoranthene | 2.84 | 0.00 | U | 2.23 | 79 | 28-134 |
| 50-32-8 | MS | Benzo(a)pyrene | 5.68 | 0.00 | U | 4.23 | 74 | 25-135 |
| 193-39-5 | MS | Indeno(1,2,3-cd)pyrene | 5.68 | 0.00 | U | 4.33 | 76 | 25-135 |
| 53-70-3 | MS | Dibenzo(a,h)anthracene | 5.68 | 0.00 | U | 4.70 | 83 | 25-133 |
| 191-24-2 | MS | Benzo(ghi)perylene | 5.68 | 0.00 | U | 3.79 | 67 | 27-140 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MSD**
**Lab Sample ID** **1203114813**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/30/2014 16:16**
**Prep Batch ID:** **1398212**
**Batch ID:** **1398214**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 91-20-3 | MSD | Naphthalene | 56.8 | 0.00 | U | 35.2 | 62 | 32-104 | 6 | 0-20 |
| 91-57-6 | MSD | 2-Methylnaphthalene | 56.8 | 0.00 | U | 41.1 | 72 | 56-130 | 7 | 0-20 |
| 90-12-0 | MSD | 1-Methylnaphthalene | 56.8 | 0.00 | U | 38.5 | 68 | 46-130 | 8 | 0-20 |
| 208-96-8 | MSD | Acenaphthylene | 56.8 | 0.00 | U | 39.0 | 69 | 26-121 | 8 | 0-20 |
| 83-32-9 | MSD | Acenaphthene | 56.8 | 0.00 | U | 41.9 | 74 | 27-118 | 8 | 0-20 |
| 86-73-7 | MSD | Fluorene | 56.8 | 0.00 | U | 42.0 | 74 | 29-123 | 5 | 0-20 |
| 85-01-8 | MSD | Phenanthrene | 56.8 | 0.00 | U | 41.9 | 74 | 35-126 | 3 | 0-20 |
| 120-12-7 | MSD | Anthracene | 56.8 | 0.00 | U | 46.0 | 81 | 36-122 | 1 | 0-20 |
| 206-44-0 | MSD | Fluoranthene | 5.68 | 0.00 | U | 4.04 | 71 | 32-134 | 1 | 0-20 |
| 129-00-0 | MSD | Pyrene | 5.68 | 0.00 | U | 4.25 | 75 | 32-134 | 1 | 0-20 |
| 56-55-3 | MSD | Benzo(a)anthracene | 5.68 | 0.00 | U | 4.22 | 74 | 35-129 | 0 | 0-20 |
| 218-01-9 | MSD | Chrysene | 5.68 | 0.00 | U | 4.57 | 80 | 25-141 | 1 | 0-20 |
| 205-99-2 | MSD | Benzo(b)fluoranthene | 5.68 | 0.00 | U | 4.21 | 74 | 29-133 | 1 | 0-20 |
| 207-08-9 | MSD | Benzo(k)fluoranthene | 2.84 | 0.00 | U | 2.25 | 79 | 28-134 | 1 | 0-20 |
| 50-32-8 | MSD | Benzo(a)pyrene | 5.68 | 0.00 | U | 4.28 | 75 | 25-135 | 1 | 0-20 |
| 193-39-5 | MSD | Indeno(1,2,3-cd)pyrene | 5.68 | 0.00 | U | 4.39 | 77 | 25-135 | 1 | 0-20 |
| 53-70-3 | MSD | Dibenzo(a,h)anthracene | 5.68 | 0.00 | U | 4.79 | 84 | 25-133 | 2 | 0-20 |
| 191-24-2 | MSD | Benzo(ghi)perylene | 5.68 | 0.00 | U | 3.85 | 68 | 27-140 | 2 | 0-20 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1398212** | **Instrument ID:** | **HPLCE.I** | **Data File:** | **ph5f3004.d** |
| **Lab Sample ID:** | **1203114810** | **Prep Date:** | **06/24/2014 06:45** | **Analyzed:** | **06/30/14 11:21** |
| **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** | | |

**This method blank applies to the following samples and quality control samples:**

| | Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 01 | LCS for batch 1398212 | 1203114811 | ph5f3005.d | 06/30/14 | 1203 |
| 02 | CALA-14-79458 | 350951003 | ph5f3006.d | 06/30/14 | 1245 |
| 03 | CALA-14-79446 | 350951011 | ph5f3007.d | 06/30/14 | 1327 |
| 04 | CALA-14-79447 | 350951017 | ph5f3008.d | 06/30/14 | 1409 |
| 05 | CALA-14-79460MS | 1203114812 | ph5f3010.d | 06/30/14 | 1534 |
| 06 | CALA-14-79460MSD | 1203114813 | ph5f3011.d | 06/30/14 | 1616 |

# QC Data

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114810** | | | | |
| **Client Sample:** | **QC for batch 1398212** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398212** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 11:21** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5f3004.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.500 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.025 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | U | 0.500 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 175 | 250 | ug/L | 70.0 | (21%-96%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114811** | | | | |
| **Client Sample:** | **QC for batch 1398212** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398212** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 12:03** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5f3005.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 42.7 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | | 45.3 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | | 46.2 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | | 43.2 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | | 47.2 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | | 4.43 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | | 4.49 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.38 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | | 3.85 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.35 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | | 4.71 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 4.57 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | | 4.24 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | | 44.6 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.59 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | | 39.9 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | | 43.9 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | | 4.44 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 168 | 250 | ug/L | 67.2 | (21%-96%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114812** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398212** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 15:34** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **440 mL** | **Final Volume:** | **.5 mL** |
| **Data File:** | **ph5f3010.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 35.4 | ug/L | 0.248 | 0.568 |
| 91-57-6 | 2-Methylnaphthalene | | 38.4 | ug/L | 0.170 | 0.568 |
| 83-32-9 | Acenaphthene | | 38.7 | ug/L | 0.170 | 0.568 |
| 208-96-8 | Acenaphthylene | | 36.0 | ug/L | 0.170 | 0.568 |
| 120-12-7 | Anthracene | | 45.4 | ug/L | 0.170 | 0.568 |
| 56-55-3 | Benzo(a)anthracene | | 4.20 | ug/L | 0.0182 | 0.0568 |
| 50-32-8 | Benzo(a)pyrene | | 4.23 | ug/L | 0.0182 | 0.0568 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.18 | ug/L | 0.0182 | 0.0568 |
| 191-24-2 | Benzo(ghi)perylene | | 3.79 | ug/L | 0.0182 | 0.0568 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.23 | ug/L | 0.00909 | 0.0284 |
| 218-01-9 | Chrysene | | 4.51 | ug/L | 0.0182 | 0.0568 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 4.70 | ug/L | 0.0182 | 0.0568 |
| 206-44-0 | Fluoranthene | | 4.00 | ug/L | 0.0182 | 0.0568 |
| 86-73-7 | Fluorene | | 39.8 | ug/L | 0.170 | 0.568 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.33 | ug/L | 0.0182 | 0.0568 |
| 91-20-3 | Naphthalene | | 33.1 | ug/L | 0.170 | 0.568 |
| 85-01-8 | Phenanthrene | | 40.7 | ug/L | 0.207 | 0.568 |
| 129-00-0 | Pyrene | | 4.21 | ug/L | 0.0182 | 0.0568 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 138 | 284 | ug/L | 48.6 | (21%-96%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114813** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398212** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MSD** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 16:16** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **440 mL** | **Final Volume:** | **.5 mL** |
| **Data File:** | **ph5f3011.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 38.5 | ug/L | 0.248 | 0.568 |
| 91-57-6 | 2-Methylnaphthalene | | 41.1 | ug/L | 0.170 | 0.568 |
| 83-32-9 | Acenaphthene | | 41.9 | ug/L | 0.170 | 0.568 |
| 208-96-8 | Acenaphthylene | | 39.0 | ug/L | 0.170 | 0.568 |
| 120-12-7 | Anthracene | | 46.0 | ug/L | 0.170 | 0.568 |
| 56-55-3 | Benzo(a)anthracene | | 4.22 | ug/L | 0.0182 | 0.0568 |
| 50-32-8 | Benzo(a)pyrene | | 4.28 | ug/L | 0.0182 | 0.0568 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.21 | ug/L | 0.0182 | 0.0568 |
| 191-24-2 | Benzo(ghi)perylene | | 3.85 | ug/L | 0.0182 | 0.0568 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.25 | ug/L | 0.00909 | 0.0284 |
| 218-01-9 | Chrysene | | 4.57 | ug/L | 0.0182 | 0.0568 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 4.79 | ug/L | 0.0182 | 0.0568 |
| 206-44-0 | Fluoranthene | | 4.04 | ug/L | 0.0182 | 0.0568 |
| 86-73-7 | Fluorene | | 42.0 | ug/L | 0.170 | 0.568 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.39 | ug/L | 0.0182 | 0.0568 |
| 91-20-3 | Naphthalene | | 35.2 | ug/L | 0.170 | 0.568 |
| 85-01-8 | Phenanthrene | | 41.9 | ug/L | 0.207 | 0.568 |
| 129-00-0 | Pyrene | | 4.25 | ug/L | 0.0182 | 0.0568 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 151 | 284 | ug/L | 53.0 | (21%-96%) |

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1397916 |
| Prep Batch Number: | 1397915 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203114155 | Interference Check Sample (ICS) |
| 1203114149 | Method Blank (MB) |
| 1203114150 | Laboratory Control Sample (LCS) |
| 1203114151 | 350951022(CALA-14-79448) Matrix Spike (MS) |
| 1203114152 | 350951022(CALA-14-79448) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
The initial calibration verification standard (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 350951022 (CALA-14-79448) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Chromatographic Columns

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 03 JUL 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CALA-14-79464

**Date Received:** 19-JUN-14

**GEL Job No (SDG):** 2014-3574

**GEL Sample ID:** 350951008

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 22-JUN-14 21:20 | per0622037a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 22-JUN-14 21:20 | per0622037a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 22-JUN-14 21:20 | per0622037a |
| | Perchlorate-O(18) | | | 0.488 | ug/L | | 1 | 22-JUN-14 21:20 | per0622037a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CALA-14-79448

**Date Received:** 19-JUN-14

**GEL Job No (SDG):** 2014-3574

**GEL Sample ID:** 350951022

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 22-JUN-14 21:30 | per0622038a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 22-JUN-14 21:30 | per0622038a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 22-JUN-14 21:30 | per0622038a |
| | Perchlorate-O(18) | | | 0.503 | ug/L | | 1 | 22-JUN-14 21:30 | per0622038a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2014-3574

**Extract Batch Code:** 1397915

**Date Filtered:** 22-JUN-14

**Matrix:** WATER

**Sample ID:** 1203114150

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .185 | ug/L | 92.6 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.03 | | | | - |
| Perchlorate-101 | 0.200 | .183 | ug/L | 91.5 | | 85 - 115 |
| Perchlorate-O(18) | | .483 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2014-3574

**Extract Batch Code:** 1397915

**Date Extracted:** 22-JUN-14

**GEL MS/PS ID:** 1203114151

**Client ID:** CALA-14-79448

**GEL MSD/PSD ID:** 1203114152

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.0113 | ug/L | 0.203 | 96 | .205 | 96.7 | .673 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.29 | | 3.13 | | 2.95 | | 5.86 | | - |
| Perchlorate-101 | 0.200 | 0.0102 | ug/L | 0.194 | 91.9 | .207 | 98.5 | 6.54 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.503 | ug/L | 0.496 | | .477 | | 3.81 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 22-JUN-14

**GEL Job No (SDG):** 2014-3574

**GEL Sample ID:** 1203114149

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 22-JUN-14 19:55 | per0622028a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 22-JUN-14 19:55 | per0622028a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 22-JUN-14 19:55 | per0622028a |
| | Perchlorate-O(18) | | | 0.484 | ug/L | | 1 | 22-JUN-14 19:55 | per0622028a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 22-JUN-14

**GEL Job No (SDG):** 2014-3574

**GEL Sample ID:** 1203114150

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.185 | ug/L | J | 1 | 22-JUN-14 20:05 | per0622029a |
| | Perchlorate Isotope Ratio | | | 3.03 | | | 1 | 22-JUN-14 20:05 | per0622029a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.183 | ug/L | J | 1 | 22-JUN-14 20:05 | per0622029a |
| | Perchlorate-O(18) | | | 0.483 | ug/L | | 1 | 22-JUN-14 20:05 | per0622029a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WASTE WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2014-3574

**GEL Sample ID:** 1203114155

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.185 | ug/L | J | 1 | 22-JUN-14 20:14 | per0622030a |
| | Perchlorate Isotope Ratio | | | 2.92 | | | 1 | 22-JUN-14 20:14 | per0622030a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.189 | ug/L | J | 1 | 22-JUN-14 20:14 | per0622030a |
| | Perchlorate-O(18) | | | 0.469 | ug/L | | 1 | 22-JUN-14 20:14 | per0622030a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CALA-14-79448MS

**Date Received:** 19-JUN-14

**GEL Job No (SDG):** 2014-3574

**GEL Sample ID:** 1203114151

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.203 | ug/L | | 1 | 22-JUN-14 21:39 | per0622039a |
| | Perchlorate Isotope Ratio | | | 3.13 | | | 1 | 22-JUN-14 21:39 | per0622039a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.194 | ug/L | J | 1 | 22-JUN-14 21:39 | per0622039a |
| | Perchlorate-O(18) | | | 0.496 | ug/L | | 1 | 22-JUN-14 21:39 | per0622039a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CALA-14-79448MSD

**Date Received:** 19-JUN-14

**GEL Job No (SDG):** 2014-3574

**GEL Sample ID:** 1203114152

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.205 | ug/L | | 1 | 22-JUN-14 21:49 | per0622040a |
| | Perchlorate Isotope Ratio | | | 2.95 | | | 1 | 22-JUN-14 21:49 | per0622040a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.207 | ug/L | | 1 | 22-JUN-14 21:49 | per0622040a |
| | Perchlorate-O(18) | | | 0.477 | ug/L | | 1 | 22-JUN-14 21:49 | per0622040a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Explosives by LCMSMS Analysis

# Case Narrative

**LC-MS/MS Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Analysis of Nitroaromatic Explosives Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by SW-846 Method 8321 Modified (8321M)** |
| Analytical Method: | SW846 3535/8321A Modified |
| Prep Method: | SW846 Method 3535 |
| Analytical Batch Number: | 1397441 |
| Prep Batch Number: | 1397439 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535/8321A Modified:

| Sample ID | Client ID |
|---|---|
| 350951004 | CALA-14-79458 |
| 350951018 | CALA-14-79447 |
| 1203112896 | Method Blank (MB) |
| 1203112897 | Laboratory Control Sample (LCS) |
| 1203112898 | 350832001(CAWA-14-79406) Matrix Spike (MS) |
| 1203112899 | 350832001(CAWA-14-79406) Matrix Spike Duplicate (MSD) |

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-056 REV# 17.

**Primary Analyte Analysis**

## Calibration Information

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
All calibration verification standards for this analysis did not meet acceptance criteria of 80-120%.

Calibration verification standard EXP0714022 recovered HMX at 77.7%. The data were Q qualified and were reported as stated in the SOP.

All other associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
All low level calibration verification (CRI) requirements for this analysis were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS (1203112897) did not meet acceptance criteria for the recovery of Tetryl at 41.8%. The limits are 65-120%. Both the MS (1203112898) and MSD (1203112899) met acceptance criteria for all target analytes. The data were reported with the appropriate DER.

**QC Sample Designation**
Client sample 350832001 (CAWA-14-79406) from SDG 2014-3570 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS (1203112898) did not meet acceptance criteria for the recovery of RDX at -165%. The limits are 67-131%. Since similar recoveries were obtained between matrix spikes, the non-conforming spike recoveries are attributed to the detection of RDX in the parent sample that exceeded the calibration range of the instrument. The data are reported with the appropriate DER.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD (1203112899) did not meet acceptance criteria for the recovery of RDX at -80%. The limits are 67-131%. Since similar recoveries were obtained between matrix spikes, the non-conforming spike recoveries are attributed to the detection of RDX in the parent sample that exceeded the calibration range of the instrument. The data are reported with the appropriate DER.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits for this analysis.

**Internal Standard (ISTD) Acceptance**
A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000.

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
The entire analytical batch was re-analyzed for non-conforming instrument QC recoveries in the original analysis. The re-analysis data are reported.

**Secondary Analyte Analysis**

## Calibration Information

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
All low level calibration verification (CRI) requirements for this analysis were met by all bracketing CRI standards.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries were within the established acceptance limits.

**QC Sample Designation**
Client sample 350832001 (CAWA-14-79406) from SDG 2014-3570 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS spike recoveries were within the established acceptance limits for this analysis.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD spike recoveries were within the established acceptance limits for this analysis.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits for this analysis.

**Internal Standard (ISTD) Acceptance**
The internal standards were not added to the Secondary analyte extracts.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data Exception Report 1315079 was generated for this SDG.

The LCS (1203112897) did not meet acceptance criteria for the recovery of Tetryl at 41.8%. The limits are 65-120%. Both the MS (1203112898) and MSD (1203112899) met acceptance criteria for all target analytes. The data were reported with the appropriate DER.

The MS (1203112898) did not meet acceptance criteria for the recovery of RDX at -165%. The limits are 67-131%. Since similar recoveries were obtained between matrix spikes, the non-conforming spike recoveries are attributed to the detection of RDX in the parent sample that exceeded the calibration range of the instrument. The data are reported with the appropriate DER.

The MSD (1203112899) did not meet acceptance criteria for the recovery of RDX at -80%. The limits are 67-131%. Since similar recoveries were obtained between matrix spikes, the non-conforming spike recoveries are attributed to the detection of RDX in the parent sample that exceeded the calibration range of the instrument. The data are reported with the appropriate DER.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples required manual integrations due to software limitations.

**Additional Comments**
Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct.

Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data.

**System Configuration**

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LC-MS/MS #1, and LC-MS/MS #2, respectively. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis.

The laboratory also utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC-MS/MS #3 or LC-MS/MS #4. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

The detection of the Primary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

The detection of the Secondary analytes is accomplished through analysis on the following reversed phase column:

YMC: J'sphere ODS-H80, 150 x 4.6mm I.D.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

Q  One or more quality control criteria have not been met. Refer to the applicable narrative or DER.

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 18 JUL 2014**  **Title: Group Leader**

# Sample Data Summary

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79458

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 350951004

**Sample Amount** 875 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714038.wiff

**Date Analyzed:** 15-JUL-14 09:04

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.286 | U | 0.0914 | 0.286 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.286 | U | 0.0914 | 0.286 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.286 | U | 0.0914 | 0.286 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.286 | U | 0.0914 | 0.286 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.286 | U | 0.0914 | 0.286 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.286 | U | 0.0914 | 0.286 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.286 | U | 0.0914 | 0.286 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.286 | U | 0.0937 | 0.286 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.286 | U | 0.0914 | 0.286 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.286 | U | 0.0914 | 0.286 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.286 | U | 0.0914 | 0.286 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.286 | U | 0.0914 | 0.286 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.571 | U | 0.0914 | 0.571 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79458

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 350951004

**Sample Amount** 875 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.571 | U | 0.114 | 0.571 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.571 | U | 0.171 | 0.571 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79458

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 350951004

**Sample Amount** 875 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160019.wiff

**Date Analyzed:** 16-JUL-14 16:05

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.14 | U | 0.343 | 1.14 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.14 | U | 0.343 | 1.14 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.14 | U | 0.343 | 1.14 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.86 | U | 0.571 | 2.86 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.86 | U | 0.571 | 2.86 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79447

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 350951018

**Sample Amount** 945 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714039.wiff

**Date Analyzed:** 15-JUL-14 09:39

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.265 | U | 0.0847 | 0.265 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.265 | U | 0.0847 | 0.265 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.265 | U | 0.0847 | 0.265 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.265 | U | 0.0847 | 0.265 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.265 | U | 0.0847 | 0.265 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.265 | U | 0.0847 | 0.265 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.265 | U | 0.0847 | 0.265 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.265 | U | 0.0868 | 0.265 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.265 | U | 0.0847 | 0.265 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.265 | U | 0.0847 | 0.265 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.265 | U | 0.0847 | 0.265 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.265 | U | 0.0847 | 0.265 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.529 | U | 0.0847 | 0.529 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79447

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 350951018

**Sample Amount** 945 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.529 | U | 0.106 | 0.529 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.529 | U | 0.159 | 0.529 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79447

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 350951018

**Sample Amount** 945 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160020.wiff

**Date Analyzed:** 16-JUL-14 16:22

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.06 | U | 0.317 | 1.06 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.06 | U | 0.317 | 1.06 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.06 | U | 0.317 | 1.06 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.65 | U | 0.529 | 2.65 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.65 | U | 0.529 | 2.65 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# Quality Control Summary

# High Explosives Surrogate Recovery Summary

**Lab Name:** GEL Laboratories LLC **GEL Job No (SDG):** 2014-3574

**Lab Code:** GEL **HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 350951004 | CALA-14-79458 | 90 | 69 - 120 | |
| 350951018 | CALA-14-79447 | 90.8 | 69 - 120 | |
| 1203112896 | MB for batch 1397439 | 80.4 | 69 - 120 | |
| 1203112897 | LCS for batch 1397439 | 88 | 69 - 120 | |
| 1203112898 | CAWA-14-79406MS | 91.6 | 69 - 120 | |
| 1203112899 | CAWA-14-79406MSD | 88.4 | 69 - 120 | |

DNT = 3,4-Dinitrotoluene

**Lab Code:** GEL **HPLC Column:** YMC J'sphere ODS-H80

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 350951004 | CALA-14-79458 | 88 | 69 - 120 | |
| 350951018 | CALA-14-79447 | 86.8 | 69 - 120 | |
| 1203112896 | MB for batch 1397439 | 88 | 69 - 120 | |
| 1203112897 | LCS for batch 1397439 | 89.2 | 69 - 120 | |
| 1203112898 | CAWA-14-79406MS | 88 | 69 - 120 | |
| 1203112899 | CAWA-14-79406MSD | 91.2 | 69 - 120 | |

DNT = 3,4-Dinitrotoluene

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Extract Batch Code:** 1397439

**Date Extracted:** 20-JUN-14

**GEL LCS ID:** 1203112897

**GEL LCSDUP ID:**

**Analysis Date/Time:** 15-JUL-14 03:50

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec # | LCSD Conc | LCSD Rec # | RPD # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | 5 | 4.12 | 82.4 | | | | | 70 - 117 |
| 2,4,6-Trinitrotoluene | 5 | 4.44 | 88.8 | | | | | 70 - 121 |
| 2,4-Dinitrotoluene | 5 | 4.53 | 90.6 | | | | | 70 - 115 |
| 2,6-Dinitrotoluene | 5 | 4.38 | 87.6 | | | | | 70 - 109 |
| 2-Amino-4,6-dinitrotoluene | 5 | 4.74 | 94.8 | | | | | 70 - 121 |
| 4-Amino-2,6-dinitrotoluene | 5 | 4.59 | 91.8 | | | | | 70 - 119 |
| HMX | 5 | 4.55 | 91 | | | | | 66 - 115 |
| Nitrobenzene | 5 | 4.31 | 86.2 | | | | | 69 - 113 |
| PETN | 5 | 3.97 | 79.4 | | | | | 67 - 121 |
| RDX | 5 | 4.84 | 96.8 | | | | | 70 - 125 |
| Tetryl | 5 | 2.09 | 41.8 * | | | | | 65 - 120 |
| m-Dinitrobenzene | 5 | 5.14 | 103 | | | | | 70 - 115 |
| m-Nitrotoluene | 5 | 4.42 | 88.4 | | | | | 69 - 113 |
| o-Nitrotoluene | 5 | 4.25 | 85 | | | | | 66 - 111 |
| p-Nitrotoluene | 5 | 4.3 | 86 | | | | | 67 - 113 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Extract Batch Code:** 1397439

**Date Extracted:** 20-JUN-14

**GEL LCS ID:** 1203112897

**GEL LCSDUP ID:**

**Analysis Date/Time:** 16-JUL-14 14:58

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec # | LCSD Conc | LCSD Rec # | RPD # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 5 | 4.13 | 82.6 | | | | | 70 - 109 |
| 2,6-Diamino-4-nitrotoluene | 5 | 4.21 | 84.2 | | | | | 61 - 117 |
| 3,5-Dinitroaniline | 5 | 3.83 | 76.6 | | | | | 70 - 117 |
| TATB | 5 | 3.49 | 69.8 | | | | | 32 - 169 |
| tris(o-cresyl) phosphate | 5 | 3.63 | 72.6 | | | | | 51 - 87 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

# High Explosives MS/MSD Summary

**Lab Name:** GEL Laboratories LLC

**Client ID:** CAWA-14-79406

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Extract Batch Code:** 1397439

**Date Extracted:** 20-JUN-14

**GEL Spike ID:** 1203112898

**GEL SpikeDup ID:** 1203112899

**Analysis Date/Time:** 15-JUL-14 05:35

**MSD Analysis Date/Time:** 15-JUL-14 06:10

**Reporting Units:** ug/L

**QC Type:** MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec | # | MSD Conc | MSD Rec | # | RPD | # | RPD Limit | Rec Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | 5.15464 | .124 | 4.47 | 84.4 | | 4.3 | 81.4 | | 4.03 | | 20 | 60 - 120 |
| 2,4,6-Trinitrotoluene | 5.15464 | 0 | 4.47 | 86.8 | | 4.37 | 85.2 | | 2.38 | | 20 | 60 - 123 |
| 2,4-Dinitrotoluene | 5.15464 | 0 | 4.61 | 89.4 | | 4.45 | 86.8 | | 3.47 | | 20 | 60 - 119 |
| 2,6-Dinitrotoluene | 5.15464 | .0647 | 4.61 | 88.1 | | 4.61 | 88.5 | | .068 | | 20 | 60 - 113 |
| 2-Amino-4,6-dinitrotoluene | 5.15464 | 0 | 4.68 | 90.8 | | 4.76 | 92.8 | | 1.67 | | 20 | 60 - 124 |
| 4-Amino-2,6-dinitrotoluene | 5.15464 | 1.9 | 7.07 | 100 | | 6.58 | 91.4 | | 7.14 | | 20 | 63 - 133 |
| HMX | 5.15464 | 7.35 | 10.4 | 59.3 | | 11.3 | 76.6 | | 8.02 | | 20 | 59 - 117 |
| Nitrobenzene | 5.15464 | 0 | 4.25 | 82.4 | | 4.4 | 85.8 | | 3.53 | | 20 | 63 - 112 |
| PETN | 5.15464 | 0 | 4.49 | 87.2 | | 4.22 | 82.2 | | 6.42 | | 20 | 65 - 118 |
| RDX | 5.15464 | 147 | 138 | -165 | * | 143 | -80 | * | 3.15 | | 20 | 67 - 131 |
| Tetryl | 5.15464 | 0 | 2.74 | 53.2 | | 2.77 | 54 | | .978 | | 20 | 44 - 109 |
| m-Dinitrobenzene | 5.15464 | 0 | 5.04 | 97.8 | | 5.36 | 105 | | 6.21 | | 20 | 60 - 117 |
| m-Nitrotoluene | 5.15464 | 0 | 4.35 | 84.4 | | 4.4 | 85.8 | | 1.13 | | 20 | 61 - 110 |
| o-Nitrotoluene | 5.15464 | .05 | 4.19 | 80.2 | | 4.09 | 78.8 | | 2.25 | | 20 | 57 - 112 |
| p-Nitrotoluene | 5.15464 | 0 | 4.67 | 90.6 | | 4.33 | 84.4 | | 7.6 | | 20 | 63 - 111 |

#Column to be used to flag recovery and RPD values with an asterisk

# High Explosives MS/MSD Summary

**Lab Name:** GEL Laboratories LLC

**Client ID:** CAWA-14-79406

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Extract Batch Code:** 1397439

**Date Extracted:** 20-JUN-14

**GEL Spike ID:** 1203112898

**GEL SpikeDup ID:** 1203112899

**Analysis Date/Time:** 16-JUL-14 15:31

**MSD Analysis Date/Time:** 16-JUL-14 15:48

**Reporting Units:** ug/L

**QC Type:** MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec | # | MSD Conc | MSD Rec | # | RPD | # | RPD Limit | Rec Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 5.15464 | 0 | 4.22 | 81.8 | | 4.23 | 82.4 | | .217 | | 20 | 68 - 116 |
| 2,6-Diamino-4-nitrotoluene | 5.15464 | 0 | 4.42 | 85.8 | | 4.02 | 78.4 | | 9.53 | | 20 | 53 - 124 |
| 3,5-Dinitroaniline | 5.15464 | .0187 | 3.95 | 76.2 | | 3.92 | 76 | | .776 | | 20 | 67 - 123 |
| TATB | 5.15464 | 0 | 3.72 | 72.2 | | 3.58 | 69.8 | | 3.89 | | 20 | 39 - 112 |
| tris(o-cresyl) phosphate | 5.15464 | 0 | 3.12 | 60.6 | | 3.34 | 65.2 | | 6.8 | | 20 | 49 - 86 |

#Column to be used to flag recovery and RPD values with an asterisk

# Quality Control Data

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1397439

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112896

**Sample Amount** 1000 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714028.wiff

**Date Analyzed:** 15-JUL-14 03:15

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.250 | U | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.250 | QU | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.250 | U | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.500 | U | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1397439

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112896

**Sample Amount** 1000 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.500 | U | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.500 | U | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1397439

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112896

**Sample Amount** 1000 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160014.wiff

**Date Analyzed:** 16-JUL-14 14:41

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.00 | U | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.00 | U | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.00 | U | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.50 | U | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.50 | U | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1397439

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112897

**Sample Amount** 1000 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714029.wiff

**Date Analyzed:** 15-JUL-14 03:50

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 2.09 | | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |
| 78-11-5 | PETN | 3.97 | | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.12 | | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.25 | | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 99-99-0 | p-Nitrotoluene | 4.3 | | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 4.31 | | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.38 | | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.42 | | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.44 | | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.53 | | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 4.55 | Q | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.59 | | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.74 | | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1397439

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112897

**Sample Amount** 1000 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 121-82-4 | RDX | 4.84 | | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.14 | | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1397439

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112897

**Sample Amount** 1000 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160015.wiff

**Date Analyzed:** 16-JUL-14 14:58

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 3.49 | | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 3.63 | | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 3.83 | | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 4.13 | | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.21 | | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-14-79406(350832001MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112898

**Sample Amount** 970 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714032.wiff

**Date Analyzed:** 15-JUL-14 05:35

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 2.74 | | 0.0825 | 0.515 |
| *479-45-8* | *Tetryl* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.19 | | 0.0845 | 0.258 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 4.25 | | 0.0825 | 0.258 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.35 | | 0.0825 | 0.258 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.47 | | 0.0825 | 0.258 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.47 | | 0.0825 | 0.258 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 78-11-5 | PETN | 4.49 | | 0.103 | 0.515 |
| *78-11-5* | *PETN* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.61 | | 0.0825 | 0.258 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.61 | | 0.0825 | 0.258 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 99-99-0 | p-Nitrotoluene | 4.67 | | 0.155 | 0.515 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.68 | | 0.0825 | 0.258 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.04 | | 0.0825 | 0.258 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 7.07 | | 0.0825 | 0.258 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-14-79406(350832001MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112898

**Sample Amount** 970 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 2691-41-0 | HMX | 10.4 | Q | 0.0825 | 0.258 |
| *2691-41-0* | *HMX* | | | | |
| 121-82-4 | RDX | 138 | | 0.0825 | 0.258 |
| *121-82-4* | *RDX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-14-79406(350832001MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112898

**Sample Amount** 970 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160017.wiff

**Date Analyzed:** 16-JUL-14 15:31

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 3.12 | | 0.309 | 1.03 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 3058-38-6 | TATB | 3.72 | | 0.309 | 1.03 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 3.95 | | 0.309 | 1.03 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 4.22 | | 0.515 | 2.58 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.42 | | 0.515 | 2.58 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-14-79406(350832001MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112899

**Sample Amount** 975 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714033.wiff

**Date Analyzed:** 15-JUL-14 06:10

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 2.77 | | 0.0821 | 0.513 |
| *479-45-8* | *Tetryl* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.09 | | 0.0841 | 0.256 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 78-11-5 | PETN | 4.22 | | 0.103 | 0.513 |
| *78-11-5* | *PETN* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.3 | | 0.0821 | 0.256 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-99-0 | p-Nitrotoluene | 4.33 | | 0.154 | 0.513 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.37 | | 0.0821 | 0.256 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 4.4 | | 0.0821 | 0.256 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.4 | | 0.0821 | 0.256 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.45 | | 0.0821 | 0.256 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.61 | | 0.0821 | 0.256 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.76 | | 0.0821 | 0.256 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.36 | | 0.0821 | 0.256 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 6.58 | | 0.0821 | 0.256 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-14-79406(350832001MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112899

**Sample Amount** 975 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 2691-41-0 | HMX | 11.3 | Q | 0.0821 | 0.256 |
| *2691-41-0* | *HMX* | | | | |
| 121-82-4 | RDX | 143 | | 0.0821 | 0.256 |
| *121-82-4* | *RDX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-14-79406(350832001MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3574

**Matrix:** WATER

**GEL Sample ID:** 1203112899

**Sample Amount** 975 mL

**Date Received:** 19-JUN-14

**Moisture:**

**Extraction Batch ID:** 1397439

**Extraction Type** Sol Exchange

**Date Extracted:** 20-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160018.wiff

**Date Analyzed:** 16-JUL-14 15:48

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 3.34 | | 0.308 | 1.03 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 3058-38-6 | TATB | 3.58 | | 0.308 | 1.03 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 3.92 | | 0.308 | 1.03 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.02 | | 0.513 | 2.56 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 4.23 | | 0.513 | 2.56 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 14-JUL-14 11:32

**GEL Data File:** EXP0714001.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 14-JUL-14 12:07

**GEL Data File:** EXP0714002.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 16-JUL-14 11:04

**GEL Data File:** EXS07160001.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 16-JUL-14 11:21

**GEL Data File:** EXS07160002.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 14-JUL-14 16:11

**GEL Data File:** EXP0714009.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 14-JUL-14 17:21

**GEL Data File:** EXP0714011.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 14-JUL-14 20:51

**GEL Data File:** EXP0714017.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 15-JUL-14 00:21

**GEL Data File:** EXP0714023.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK06

**Analysis Date:** 15-JUL-14 02:40

**GEL Data File:** EXP0714027.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 15-JUL-14 06:45

**GEL Data File:** EXP0714034.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK08

**Analysis Date:** 15-JUL-14 07:55

**GEL Data File:** EXP0714036.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK09

**Analysis Date:** 15-JUL-14 10:14

**GEL Data File:** EXP0714040.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK10

**Analysis Date:** 15-JUL-14 13:44

**GEL Data File:** EXP0714046.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK11

**Analysis Date:** 15-JUL-14 14:54

**GEL Data File:** EXP0714048.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 16-JUL-14 13:34

**GEL Data File:** EXS07160010.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 6.96 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.31 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 16-JUL-14 14:08

**GEL Data File:** EXS07160012.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 3.3 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3574

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 16-JUL-14 16:55

**GEL Data File:** EXS07160022.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 2.89 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 18-JUL-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LC-MS/MS | SW846 3535/8321A Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397441 | See Below | | |

**Potentially affected work order(s)(SDG): 350832(2014-3570),350951(2014-3574)**

**Application Issues:**

Failed Recovery for LCS/LCSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The LCS (1203112897) did not meet acceptance criteria for the recovery of Tetryl at 41.8%. The limits are 65-120%. | 1. Both the MS (1203112898) and MSD (1203112899) met acceptance criteria for all target analytes. The data are reported with the appropriate DER. |
| 2. The MS (1203112898) did not meet acceptance criteria for the recovery of RDX at -165%. The limits are 67-131%. | 2. & 3. Since similar recoveries were obtained between matrix spikes, the non-conforming spike recoveries are attributed to the detection of RDX in the parent sample that exceeded the calibration range of the instrument. The data are reported with the appropriate DER. |
| 3. The MSD (1203112899) did not meet acceptance criteria for the recovery of RDX at -80%. The limits are 67-131%. | |

**Originator's Name:**

Lynne Russell 18-JUL-14

**Data Validator/Group Leader:**

Michael Penny 18-JUL-14

# Pesticide Analysis

# Case Narrative

**Pesticide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water by GC/ECD Using Methods 504.1 or 8011** |
| Analytical Method: | SW846 8011 |
| Prep Method: | SW846 8011 PREP |
| Analytical Batch Number: | 1397233 |
| Prep Batch Number: | 1397232 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 350951001 | CALA-14-79458 |
| 350951009 | CALA-14-79446 |
| 350951015 | CALA-14-79447 |
| 350951023 | CALA-14-79451 |
| 1203112399 | Method Blank (MB) |
| 1203112400 | Laboratory Control Sample (LCS) |
| 1203112401 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-059 REV# 12.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Sample 350951023 (CALA-14-79451) did not meet acceptance criteria for surrogate recovery. There was no more sample left for re-extraction; therefore, the data are reported.

**Laboratory Control Sample (LCS) Recovery**
The laboratory control sample (LCS) spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD values between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike (MS) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike Duplicate (MSD) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**MS/MSD Relative Percent Difference (RPD) Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Technical Information:**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG in this analytical batch met the specified holding time.

**Sample preservation**
Sample had a pH of 2. 350951023 (CALA-14-79451).

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

**Sample Dilutions**
The samples in this SDG in this analytical batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Electronic Package Comment**

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER# 1307895.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

**Additional Comments**
The higher result is reported.

**System Configuration**

The 504.1/8011 analysis of EDB/DBCP was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-50-504/8011 | 30m x 0.53mm, 1.00um |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-XLB-504/8 | 30m x 0.53mm, 1.50um |

**Method/Analysis Information**

| | |
|---|---|
| **Procedure:** | **Organochlorine Pesticides and Chlorinated Hydrocarbons** |
| Analytical Method: | SW846 3535A/8081B |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1398217 |
| Prep Batch Number: | 1398216 |

**Sample Analysis**

| Sample ID | Client ID |
|---|---|
| 350951006 | CALA-14-79458 |
| 350951012 | CALA-14-79446 |
| 350951020 | CALA-14-79447 |
| 1203114814 | Method Blank (MB) |
| 1203114815 | Laboratory Control Sample (LCS) |
| 1203114816 | 351059006(CALA-14-79460) Matrix Spike (MS) |
| 1203114818 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

**Preparation/Analytical Method Verification**

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-041 REV# 13.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation quantitation reports per standard operating procedures (SOP).

**Calibration Information**

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for this analytical batch for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The laboratory control sample (LCS) spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD values between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 351059006 (CALA-14-79460) was selected for the matrix spike analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

**Technical Information:**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG in this analytical batch met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

**Sample Dilutions**
The samples in this SDG in this analytical batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Florisil**
Florisil clean-up was not performed on client and quality control samples in this batch.

**Miscellaneous Information:**

**Electronic Package Comment**

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

**Additional Comments**

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Detected target analytes were reported from the analytical column with the lower concentration. Results below the method detection limit (non-detects) were reported from column one.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate recovery acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

**System Configuration**

The Semi-Volatiles-Pesticide analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD7A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7673 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide I) |
| ECD7A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7673 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

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## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Cameron Bearden  **Name: Cameron Bearden**

**Date: 15 JUL 2014**  **Title: Group Leader**

# Sample Data Summary

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951001** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1397233** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 18:05** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/23/2014 18:05** | **Aliquot:** | **34.96 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **062314HE\E1f2310.D** | **Column:** | **1 ZB-50** | | |
| | **062314HE\E1f2310.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.020 | ug/L | 0.00601 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.020 | ug/L | 0.00601 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.60 | 3.58 | ug/L | 101 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951006** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:52** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **980 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2417.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2417.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | U | 0.0204 | ug/L | 0.00638 | 0.0204 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.766 | 1.02 | ug/L | 75.1 | (36%-106%) |
| Decachlorobiphenyl | 0.960 | 1.02 | ug/L | 94.0 | (41%-124%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951009** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1397233** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 18:26** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/23/2014 18:26** | **Aliquot:** | **35.4 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **062314HE\E1f2311.D** | **Column:** | **1 ZB-50** | | |
| | **062314HE\E1f2311.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0198 | ug/L | 0.00593 | 0.0198 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0198 | ug/L | 0.00593 | 0.0198 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.93 | 3.53 | ug/L | 111 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951012** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 18:09** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **960 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2418.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2418.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | U | 0.0208 | ug/L | 0.00651 | 0.0208 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.841 | 1.04 | ug/L | 80.8 | (36%-106%) |
| Decachlorobiphenyl | 1.06 | 1.04 | ug/L | 102 | (41%-124%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951015** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1397233** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 18:47** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/23/2014 18:47** | **Aliquot:** | **34.59 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **062314HE\E1f2312.D** | **Column:** | **1 ZB-50** | | |
| | **062314HE\E1f2312.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0202 | ug/L | 0.00607 | 0.0202 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0202 | ug/L | 0.00607 | 0.0202 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.42 | 3.61 | ug/L | 122 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951020** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 18:25** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **960 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2419.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2419.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | U | 0.0208 | ug/L | 0.00651 | 0.0208 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.831 | 1.04 | ug/L | 79.8 | (36%-106%) |
| Decachlorobiphenyl | 0.837 | 1.04 | ug/L | 80.4 | (41%-124%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951023** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79451** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1397233** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 19:08** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/23/2014 19:08** | **Aliquot:** | **34.99 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **062314HE\E1f2313.D** | **Column:** | **1 ZB-50** | | |
| | **062314HE\E1f2313.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | | Acceptable Limits |
|---|---|---|---|---|---|---|
| Bromofluorobenzene | 62.7 | 3.57 | ug/L | 1760 | * | (73%-135%) |

# Quality Control Summary

**Pesticide**

## Surrogate Recovery Report

**SDG Number: 2014-3574**

**Matrix Type: LIQUID**

| Sample ID | Client ID | BFB 1 %REC # | BFB 2 %REC # |
|---|---|---|---|
| 1203112399 | MB for batch 1397232 | 109 | 98 |
| 1203112400 | LCS for batch 1397232 | 115 | 117 |
| 1203112401 | LCSD for batch 1397232 | 117 | 119 |
| 350951001 | CALA-14-79458 | 101 | 92 |
| 350951009 | CALA-14-79446 | 111 | 100 |
| 350951015 | CALA-14-79447 | 122 | 110 |
| 350951023 | CALA-14-79451 | 191 * | 1756 * |

| Surrogate | Acceptance Limits |
|---|---|
| BFB = Bromofluorobenzene | (73%-135%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Pesticide**

## Surrogate Recovery Report

**SDG Number: 2014-3574**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|---|---|---|---|---|---|
| 1203114814 | MB for batch 1398216 | 83 | 81 | 98 | 100 |
| 1203114815 | LCS for batch 1398216 | 81 | 79 | 91 | 94 |
| 1203114818 | LCSD for batch 1398216 | 73 | 71 | 89 | 90 |
| 350951006 | CALA-14-79458 | 75 | 75 | 94 | 94 |
| 350951012 | CALA-14-79446 | 83 | 81 | 102 | 102 |
| 350951020 | CALA-14-79447 | 81 | 80 | 81 | 80 |
| 1203114816 | CALA-14-79460MS | 76 | 74 | 84 | 83 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 4CMX | = 4cmx | (36%-106%) |
| DCB | = Decachlorobiphenyl | (41%-124%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Pesticide**

## Quality Control Summary
## Spike Recovery Report

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1397232**
**Lab Sample ID** **1203112400**
**Instrument:** **ECD1A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/23/2014 17:21**
**Prep Batch ID:** **1397232**
**Batch ID:** **1397233**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-93-4 | LCS | 1,2-Dibromoethane | 0.200 | 0.0 | 0.229 | 114 | 70-130 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.243 | 122 | 70-130 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCSD for batch 1397232**
**Lab Sample ID** **1203112401**
**Instrument:** **ECD1A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **06/23/2014 17:43**
**Dilution: 1**
**Prep Batch ID:** **1397232**
**Batch ID:** **1397233**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-93-4 | LCSD 1,2-Dibromoethane | 0.200 | 0.0 | 0.231 | 116 | 70-130 | 1 | 0-20 |
| 96-12-8 | LCSD 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.250 | 125 | 70-130 | 3 | 0-20 |

**Pesticide**

## Quality Control Summary
## Spike Recovery Report

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1398216**
**Lab Sample ID** **1203114815**
**Instrument:** **ECD7A.I**
**Analyst:** **LOF**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/24/2014 17:20**
**Prep Batch ID:** **1398216**
**Batch ID:** **1398217**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 118-74-1 | LCS | Hexachlorobenzene | 0.100 | 0.0 | 0.0728 | 73 | 50-150 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCSD for batch 1398216**
**Lab Sample ID** **1203114818**
**Instrument:** **ECD7A.I**
**Analyst:** **LOF**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **06/24/2014 17:36**
**Dilution: 1**
**Prep Batch ID:** **1398216**
**Batch ID:** **1398217**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 118-74-1 | LCSD Hexachlorobenzene | 0.100 | 0.0 | 0.0674 | 67 | 50-150 | 8 | 0-30 |

**Pesticide**

## Quality Control Summary
## Spike Recovery Report

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114816**
**Instrument:** **ECD7A.I**
**Analyst:** **LOF**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/24/2014 18:57**
**Prep Batch ID:** **1398216**
**Batch ID:** **1398217**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 118-74-1 | MS | Hexachlorobenzene | 0.104 | 0.00 | U | 0.0821 | 79 | 50-150 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1397232** | **Instrument ID:** | **ECD1A.I_1**<br>**ECD1A.I_2** | **Data File:** | **062314HE\E1f2307.D**<br>**062314HE\E1f2307.D** |
| **Lab Sample ID:** | **1203112399** | | | | |
| **Column:** | **ZB-50**<br>**ZB-XLB** | **Prep Date:** | **06/23/2014 17:00** | **Analyzed:** | **06/23/14 17:00** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1397232** | **1203112400** | **062314HE\E1f2308.D**<br>**062314HE\E1f2308.D** | **06/23/14** | **1721** |
| **02 LCSD for batch 1397232** | **1203112401** | **062314HE\E1f2309.D**<br>**062314HE\E1f2309.D** | **06/23/14** | **1743** |
| **03 CALA-14-79458** | **350951001** | **062314HE\E1f2310.D**<br>**062314HE\E1f2310.D** | **06/23/14** | **1805** |
| **04 CALA-14-79446** | **350951009** | **062314HE\E1f2311.D**<br>**062314HE\E1f2311.D** | **06/23/14** | **1826** |
| **05 CALA-14-79447** | **350951015** | **062314HE\E1f2312.D**<br>**062314HE\E1f2312.D** | **06/23/14** | **1847** |
| **06 CALA-14-79451** | **350951023** | **062314HE\E1f2313.D**<br>**062314HE\E1f2313.D** | **06/23/14** | **1908** |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1398216** | **Instrument ID:** | **ECD7A.I_1**<br>**ECD7A.I_2** | **Data File:** | **062414.B\e7f2414.D**<br>**062414.B\e7f2414.D** |
| **Lab Sample ID:** | **1203114814** | | | | |
| **Column:** | **CLPesticides**<br>**CLPesticides2** | **Prep Date:** | **06/24/2014 06:30** | **Analyzed:** | **06/24/14 17:04** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1398216** | **1203114815** | **062414.B\e7f2415.D**<br>**062414.B\e7f2415.D** | **06/24/14** | **1720** |
| **02 LCSD for batch 1398216** | **1203114818** | **062414.B\e7f2416.D**<br>**062414.B\e7f2416.D** | **06/24/14** | **1736** |
| **03 CALA-14-79458** | **350951006** | **062414.B\e7f2417.D**<br>**062414.B\e7f2417.D** | **06/24/14** | **1752** |
| **04 CALA-14-79446** | **350951012** | **062414.B\e7f2418.D**<br>**062414.B\e7f2418.D** | **06/24/14** | **1809** |
| **05 CALA-14-79447** | **350951020** | **062414.B\e7f2419.D**<br>**062414.B\e7f2419.D** | **06/24/14** | **1825** |
| **06 CALA-14-79460MS** | **1203114816** | **062414.B\e7f2421.D**<br>**062414.B\e7f2421.D** | **06/24/14** | **1857** |

# Quality Control Data

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203112399** | | | | |
| **Client Sample:** | **QC for batch 1397232** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1397232** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1397233** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 17:00** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/23/2014 17:00** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **062314HE\E1f2307.D** | **Column:** | **1 ZB-50** | | |
| | **062314HE\E1f2307.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.90 | 3.57 | ug/L | 109 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203112400** | | | | |
| **Client Sample:** | **QC for batch 1397232** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1397232** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1397233** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 17:21** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/23/2014 17:21** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **062314HE\E1f2308.D** | **Column:** | **1 ZB-50** | | |
| | **062314HE\E1f2308.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.243 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.229 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.17 | 3.57 | ug/L | 117 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203112401** | | | | |
| **Client Sample:** | **QC for batch 1397232** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1397232** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1397233** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 17:43** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/23/2014 17:43** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **062314HE\E1f2309.D** | **Column:** | **1 ZB-50** | | |
| | **062314HE\E1f2309.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.250 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.231 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.25 | 3.57 | ug/L | 119 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114814** | | | | |
| **Client Sample:** | **QC for batch 1398216** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398216** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:04** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2414.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2414.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | U | 0.020 | ug/L | 0.00625 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.979 | 1.00 | ug/L | 97.9 | (41%-124%) |
| 4cmx | 0.808 | 1.00 | ug/L | 80.8 | (36%-106%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114815** | | | | |
| **Client Sample:** | **QC for batch 1398216** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398216** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:20** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2415.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2415.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | | 0.0728 | ug/L | 0.00625 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.914 | 1.00 | ug/L | 91.4 | (41%-124%) |
| 4cmx | 0.788 | 1.00 | ug/L | 78.8 | (36%-106%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114816** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398216** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 18:57** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **960 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2421.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2421.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | | 0.0821 | ug/L | 0.00651 | 0.0208 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.770 | 1.04 | ug/L | 73.9 | (36%-106%) |
| Decachlorobiphenyl | 0.870 | 1.04 | ug/L | 83.5 | (41%-124%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114818** | | | | |
| **Client Sample:** | **QC for batch 1398216** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1398216** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:36** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2416.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2416.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | | 0.0674 | ug/L | 0.00625 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.892 | 1.00 | ug/L | 89.2 | (41%-124%) |
| 4cmx | 0.715 | 1.00 | ug/L | 71.5 | (36%-106%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 24-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| GC/ECD | SW846 8011 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397233 | See Below | | |

**Potentially affected work order(s)(SDG): 350951(2014-3574)**

**Application Issues:**

Container scanning event for custody missed

Failed Yield for Surrogates

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Container scanning event for custody missed for samples 350951001, 009, 015, 023. | 1. The analyst did not scan samples into his/her custody. The analyst had physical custody of the sample during the analysis. |
| 2. Surrogate recovered outside of acceptance limits for sample 350951023. | 2. The sample recovered above the acceptance limits for the surrogate possibly due to surrogate peak coelution with the matrix peaks; however, this non-compliance had no adverse effects on the data as the target analytes were not detected in sample 350951023. The data were reported. |

**Originator's Name:**

Lindsey Jensen 24-JUN-14

**Data Validator/Group Leader:**

Jimin Cao 25-JUN-14

# PCB Analysis

# Case Narrative

**PCB Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Polychlorinated Biphenyls by ECD** |
| Analytical Method: | SW846 3535A/8082 |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1397329 |
| Prep Batch Number: | 1397328 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

| Sample ID | Client ID |
|---|---|
| 350951002 | CALA-14-79458 |
| 350951010 | CALA-14-79446 |
| 350951016 | CALA-14-79447 |
| 1203112639 | Method Blank (MB) |
| 1203112640 | Laboratory Control Sample (LCS) |
| 1203112641 | 350600001(WSTMO-14-75612) Matrix Spike (MS) |
| 1203112642 | 350600001(WSTMO-14-75612) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria for the target analytes.

All analytes were within the established retention time windows for this method.

One of the five quantified peaks did not meet the acceptance criteria in one of the Aroclor-1260 standards analyzed for this SDG; however, the average concentration of the five quantified peaks met the acceptance criteria.

Surrogate recovery did not meet the acceptance criteria in one of the CCV standards analyzed for this SDG; however, this had no adverse effects on the data as all associated ARSL samples were recovered well within the acceptance range for the surrogate.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
ARSL sample 350600001 (WSTMO-14-75612) of similar matrix in SDG 2014-3537 was selected for the matrix spike and matrix spike duplicate analysis for this batch of the samples.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPD between the MS and MSD met the acceptance limits.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this batch.

## Miscellaneous Information

### Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### Data Exception (DER) Documentation

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

### Manual Integrations

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

### Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS and MSD are from the same analytical column as the parent sample.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

## System Configuration

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD9A.I_1 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 1 | 30m x 0.25mm, 0.25um |

| | | | | |
|---|---|---|---|---|
| ECD9A.I_2 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 2 | 30m x 0.25mm, 0.20um |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Jimi Cao  **Name: Jimin Cao**

**Date: 25 JUN 2014**  **Title: Data Validator**

# Sample Data Summary

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951002** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1397329** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 15:33** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/20/2014 06:33** | **Aliquot:** | **980 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062314.S\E9f2344.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062314.S\E9f2344.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.102 | ug/L | 0.034 | 0.102 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.102 | ug/L | 0.034 | 0.102 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.102 | ug/L | 0.034 | 0.102 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.102 | ug/L | 0.034 | 0.102 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.102 | ug/L | 0.034 | 0.102 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.102 | ug/L | 0.034 | 0.102 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.102 | ug/L | 0.034 | 0.102 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.102 | ug/L | 0.034 | 0.102 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.128 | 0.204 | ug/L | 62.9 | (45%-120%) |
| 4cmx | 0.131 | 0.204 | ug/L | 64.2 | (45%-120%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951010** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1397329** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 15:46** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/20/2014 06:33** | **Aliquot:** | **950 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062314.S\E9f2345.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062314.S\E9f2345.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.128 | 0.211 | ug/L | 60.6 | (45%-120%) |
| 4cmx | 0.138 | 0.211 | ug/L | 65.8 | (45%-120%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951016** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1397329** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 16:00** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/20/2014 06:33** | **Aliquot:** | **950 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062314.S\E9f2346.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062314.S\E9f2346.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.151 | 0.211 | ug/L | 71.7 | (45%-120%) |
| 4cmx | 0.152 | 0.211 | ug/L | 72.3 | (45%-120%) |

# Quality Control Summary

**PCB**

## Surrogate Recovery Report

**SDG Number: 2014-3574**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|---|---|---|---|---|---|
| 1203112639 | MB for batch 1397328 | 74 | 76 | 80 | 80 |
| 1203112640 | LCS for batch 1397328 | 81 | 83 | 71 | 84 |
| 1203112641 | WSTMO-14-75612MS | 64 | 63 | 68 | 67 |
| 1203112642 | WSTMO-14-75612MSD | 66 | 66 | 70 | 70 |
| 350951002 | CALA-14-79458 | 63 | 64 | 63 | 51 |
| 350951010 | CALA-14-79446 | 65 | 66 | 61 | 52 |
| 350951016 | CALA-14-79447 | 72 | 72 | 72 | 63 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 4CMX | = 4cmx | (45%-120%) |
| DCB | = Decachlorobiphenyl | (45%-120%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1397328**
**Lab Sample ID** **1203112640**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/23/2014 12:26**
**Prep Batch ID:** **1397328**
**Batch ID:** **1397329**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCS | Aroclor-1016 | 1.00 | 0.0 | 0.859 | 86 | 48-109 |
| 11096-82-5 | LCS | Aroclor-1260 | 1.00 | 0.0 | 0.817 | 82 | 54-111 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **WSTMO-14-75612MS**
**Lab Sample ID** **1203112641**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/23/2014 13:16**
**Prep Batch ID:** **1397328**
**Batch ID:** **1397329**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MS | Aroclor-1016 | 1.05 | 0.00 | U | 0.686 | 65 | 40-104 |
| 11096-82-5 | MS | Aroclor-1260 | 1.05 | 0.00 | U | 0.709 | 67 | 42-112 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **WSTMO-14-75612MSD**
**Lab Sample ID** **1203112642**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/23/2014 13:29**
**Prep Batch ID:** **1397328**
**Batch ID:** **1397329**
**Dilution: 1**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MSD Aroclor-1016 | 1.05 | 0.00 U | 0.701 | 67 | 40-104 | 2 | 0-30 |
| 11096-82-5 | MSD Aroclor-1260 | 1.05 | 0.00 U | 0.742 | 70 | 42-112 | 5 | 0-30 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1397328** | **Instrument ID:** | **ECD9A.I_1**<br>**ECD9A.I_2** | **Data File:** | **062314.S\E9f2328.D**<br>**062314.S\E9f2328.D** |
| **Lab Sample ID:** | **1203112639** | | | | |
| **Column:** | **RTX-CLPEST 1**<br>**RTX-CLPEST 2** | **Prep Date:** | **06/20/2014 06:33** | **Analyzed:** | **06/23/14 12:01** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1397328** | **1203112640** | **062314.S\E9f2330.D**<br>**062314.S\E9f2330.D** | **06/23/14** | **1226** |
| **02 WSTMO-14-75612MS** | **1203112641** | **062314.S\E9f2334.D**<br>**062314.S\E9f2334.D** | **06/23/14** | **1316** |
| **03 WSTMO-14-75612MSD** | **1203112642** | **062314.S\E9f2335.D**<br>**062314.S\E9f2335.D** | **06/23/14** | **1329** |
| **04 CALA-14-79458** | **350951002** | **062314.S\E9f2344.D**<br>**062314.S\E9f2344.D** | **06/23/14** | **1533** |
| **05 CALA-14-79446** | **350951010** | **062314.S\E9f2345.D**<br>**062314.S\E9f2345.D** | **06/23/14** | **1546** |
| **06 CALA-14-79447** | **350951016** | **062314.S\E9f2346.D**<br>**062314.S\E9f2346.D** | **06/23/14** | **1600** |

# Quality Control Data

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203112639** | | | | |
| **Client Sample:** | **QC for batch 1397328** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1397328** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1397329** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 12:01** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/20/2014 06:33** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062314.S\E9f2328.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062314.S\E9f2328.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.161 | 0.200 | ug/L | 80.5 | (45%-120%) |
| 4cmx | 0.152 | 0.200 | ug/L | 76.1 | (45%-120%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203112640** | | | | |
| **Client Sample:** | **QC for batch 1397328** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1397328** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1397329** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/23/2014 12:26** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/20/2014 06:33** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062314.S\E9f2330.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062314.S\E9f2330.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.859 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.817 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.165 | 0.200 | ug/L | 82.5 | (45%-120%) |
| Decachlorobiphenyl | 0.169 | 0.200 | ug/L | 84.4 | (45%-120%) |

# Herbicide Analysis

# Case Narrative

**Herbicide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Chlorophenoxy Acid Herbicides by ECD** |
| Analytical Method: | SW846 8151A |
| Prep Method: | SW846 8151A |
| Analytical Batch Number: | 1397789 |
| Prep Batch Number: | 1397787 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8151A:

| Sample ID | Client ID |
|---|---|
| 350951007 | CALA-14-79458 |
| 350951013 | CALA-14-79446 |
| 350951021 | CALA-14-79447 |
| 1203113792 | Method Blank (MB) |
| 1203113793 | 350951007(CALA-14-79458) Matrix Spike (MS) |
| 1203113794 | Laboratory Control Sample (LCS) |
| 1203113795 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-011 REV# 21.

Raw data reports are processed and reviewed by the analyst using ChemStation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All Initial Calibration Verification (ICV) requirements have been met for this SDG. However, not all Calibration Verification Standards (CCV) requirements were met. Pentachlorophenol failed acceptance criteria with a positive bias on one analytical column in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. Since the target

analyte was not detected in the samples, the non-compliance had no adverse impact on the data. All analytes were within the established retention time windows for this method.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD(s) between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 350951007 (CALA-14-79458) was selected for analysis as the matrix spike. A matrix spike duplicate was not extracted or analyzed with this batch. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
There was no matrix spike duplicate extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**MS/MSD Relative Percent Difference (RPD) Statement**
There are no reportable MS/MSD RDP values since a MSD was not extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported target analyte concentrations were confirmed on a dissimilar column.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**

Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

## Miscellaneous Information

### Electronic Package Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### Data Exception (DER) Documentation

Data Exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A Data Exception Report (DER) was not required for this SDG.

### Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this Herbicide fraction.

### Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS are from the same analytical column as the parent sample. The data reported for the LCSD are from the same analytical column as the LCS. The container scanning event for custody was missed for samples 350951007 (CALA-14-79458), 350951013 (CALA-14-79446) and 350951021 (CALA-14-79447). The laboratory maintained custody of the samples throughout the analysis process.

Due to rounding differences in the calculation between the forms, the data reported in the Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

## System Configuration

The Semi-Volatiles-HERB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD3A.I_1 | Agilent 7890A GC with duel uECD | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |

| | | | | |
|---|---|---|---|---|
| ECD3A.I_2 | Agilent 7890A GC with duel uECD | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticideII) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 15 JUL 2014**  **Title: Data Validator**

# Sample Data Summary

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951007** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79458** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 18:56** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **920 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2413.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2413.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.272 | ug/L | 0.0543 | 0.272 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.75 | 5.43 | ug/L | 87.5 | (43%-137%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951013** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79446** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 19:46** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **920 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2415.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2415.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.272 | ug/L | 0.0543 | 0.272 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.95 | 5.43 | ug/L | 91.1 | (43%-137%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **350951021** | **Date Received:** | **06/19/2014 08:50** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79447** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 20:10** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **960 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2416.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2416.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.260 | ug/L | 0.0521 | 0.260 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.94 | 5.21 | ug/L | 94.9 | (43%-137%) |

# Quality Control Summary

**Herbicide**

## Surrogate Recovery Report

**SDG Number: 2014-3574**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCAA 1 %REC # | DCAA 2 %REC # |
|---|---|---|---|
| 1203113792 | MB for batch 1397787 | 83 | 93 |
| 1203113794 | LCS for batch 1397787 | 91 | 92 |
| 1203113795 | LCSD for batch 1397789 | 92 | 92 |
| 350951007 | CALA-14-79458 | 79 | 87 |
| 1203113793 | CALA-14-79458MS | 98 | 91 |
| 350951013 | CALA-14-79446 | 83 | 91 |
| 350951021 | CALA-14-79447 | 91 | 95 |

| Surrogate | Acceptance Limits |
|---|---|
| DCAA = 2,4-Dichlorophenylacetic acid | (43%-137%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **CALA-14-79458MS**
**Lab Sample ID** **1203113793**
**Instrument:** **ECD3A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/24/2014 19:21**
**Prep Batch ID:** **1397787**
**Batch ID:** **1397789**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | MS | Pentachlorophenol | 2.17 | 0.00 | U | 1.89 | 87 | 37-114 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCS for batch 1397787**
**Lab Sample ID** **1203113794**
**Instrument:** **ECD3A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/24/2014 17:03**
**Prep Batch ID:** **1397787**
**Batch ID:** **1397789**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 87-86-5 | LCS | Pentachlorophenol | 2.00 | 0.0 | 1.90 | 95 | 55-113 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3574**
**Client ID:** **LCSD for batch 1397789**
**Lab Sample ID** **1203113795**
**Instrument:** **ECD3A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **06/24/2014 17:27**
**Dilution: 1**
**Prep Batch ID:** **1397787**
**Batch ID:** **1397789**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | LCSD Pentachlorophenol | 2.00 | 0.0 | 1.94 | 97 | 55-113 | 2 | 0-30 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1397787** | **Instrument ID:** | **ECD3A.I_1**<br>**ECD3A.I_2** | **Data File:** | **062414.B\e3f2407.D**<br>**062414.B\e3f2407.D** |
| **Lab Sample ID:** | **1203113792** | | | | |
| **Column:** | **RTX-CLPEST 1**<br>**RTX-CLPEST 2** | **Prep Date:** | **06/24/2014 06:50** | **Analyzed:** | **06/24/14 16:38** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1397787** | **1203113794** | **062414.B\e3f2408.D**<br>**062414.B\e3f2408.D** | **06/24/14** | **1703** |
| **02 LCSD for batch 1397789** | **1203113795** | **062414.B\e3f2409.D**<br>**062414.B\e3f2409.D** | **06/24/14** | **1727** |
| **03 CALA-14-79458** | **350951007** | **062414.B\e3f2413.D**<br>**062414.B\e3f2413.D** | **06/24/14** | **1856** |
| **04 CALA-14-79458MS** | **1203113793** | **062414.B\e3f2414.D**<br>**062414.B\e3f2414.D** | **06/24/14** | **1921** |
| **05 CALA-14-79446** | **350951013** | **062414.B\e3f2415.D**<br>**062414.B\e3f2415.D** | **06/24/14** | **1946** |
| **06 CALA-14-79447** | **350951021** | **062414.B\e3f2416.D**<br>**062414.B\e3f2416.D** | **06/24/14** | **2010** |

# Quality Control Data

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203113792** | | | | |
| **Client Sample:** | **QC for batch 1397787** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1397787** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 16:38** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2407.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2407.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.250 | ug/L | 0.050 | 0.250 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.63 | 5.00 | ug/L | 92.6 | (43%-137%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203113793** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1397787** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458MS** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 19:21** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **920 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2414.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2414.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.89 | ug/L | 0.0543 | 0.272 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.95 | 5.43 | ug/L | 91.1 | (43%-137%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203113794** | | | | |
| **Client Sample:** | **QC for batch 1397787** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1397787** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:03** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2408.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2408.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.90 | ug/L | 0.050 | 0.250 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.61 | 5.00 | ug/L | 92.3 | (43%-137%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3574** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203113795** | | | | |
| **Client Sample:** | **QC for batch 1397787** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1397789** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:27** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2409.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2409.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.94 | ug/L | 0.050 | 0.250 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.60 | 5.00 | ug/L | 92.0 | (43%-137%) |

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

**Sample Analysis**

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951008 | CALA-14-79464 |
| 350951019 | CALA-14-79447 |
| 350951022 | CALA-14-79448 |
| 1203112571 | Method Blank (MB) **ICP** |
| 1203112572 | Laboratory Control Sample (LCS) |
| 1203112575 | 350951008(CALA-14-79464L) Serial Dilution (SD) |
| 1203112573 | 350951008(CALA-14-79464D) Sample Duplicate (DUP) |
| 1203112574 | 350951008(CALA-14-79464S) Matrix Spike (MS) |
| 1203112561 | Method Blank (MB) **ICP-MS** |
| 1203112562 | Laboratory Control Sample (LCS) |
| 1203112565 | 350951008(CALA-14-79464L) Serial Dilution (SD) |
| 1203112563 | 350951008(CALA-14-79464D) Sample Duplicate (DUP) |
| 1203112564 | 350951008(CALA-14-79464S) Matrix Spike (MS) |
| 1203115078 | Method Blank (MB) **CVAA** |
| 1203115079 | Laboratory Control Sample (LCS) |
| 1203115085 | 350760005(WTRON-14-79963L) Serial Dilution (SD) |
| 1203115083 | 350760005(WTRON-14-79963D) Sample Duplicate (DUP) |
| 1203115084 | 350760005(WTRON-14-79963S) Matrix Spike (MS) |

**Method/Analysis Information**

| | |
|---|---|
| **Analytical Batch:** | 1397305, 1397300, 1398324 and 1404141 |
| **Prep Batch :** | 1397304, 1397299 and 1398323 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 10, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 27 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**System Configuration**

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

**Calibration Information**

**Instrument Calibration**

All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL/PQL Requirements**

All PQL standards for 6010C met the control limits with the exception of sodium listed below. The sample concentrations were less than the MDL or greater than 2x the PQL, so the data is not adversely affected. 350951008 (CALA-14-79464) and 350951022 (CALA-14-79448)-ICP.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blanks (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 350951008 (CALA-14-79464)-ICP and ICP-MS and 350760005 (WTRON-14-79963)-CVAA.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples required dilutionsfor tin in order to minimize suppression due to matrix interferences. 350951008 (CALA-14-79464) and 350951022 (CALA-14-79448)-ICP.

**Preparation Information**
The samples in this SDG were prepared exactly according to the cited SOP.

**Miscellaneous Information**

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

**Additional Comments**
Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:** 7-17-14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by Nick-Cole A. Elmore 7-17-14

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3574 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 350951005 **BASIS:** As Received **DATE COLLECTED** 17−JUN−14

**CLIENT ID:** CALA−14−79458 **LEVEL:** Low **DATE RECEIVED** 19−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 06/25/14 15:40 | 062514W2−5 | 1398324 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1398324 | 1398323 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 06/24/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3574 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 350951008 **BASIS:** As Received **DATE COLLECTED** 17−JUN−14

**CLIENT ID:** CALA−14−79464 **LEVEL:** Low **DATE RECEIVED** 19−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 06/25/14 15:42 | 062514W2−5 | 1398324 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−3574 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 350951008 **BASIS:** As Received **DATE COLLECTED** 17−JUN−14

**CLIENT ID:** CALA−14−79464 **LEVEL:** Low **DATE RECEIVED** 19−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7440−38−2 | Arsenic | 5 | ug/L | U | 1.7 | 5 | 5 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7440−39−3 | Barium | 179 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−42−8 | Boron | 66.7 | ug/L | | 15 | 50 | 50 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7440−70−2 | Calcium | 64000 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−47−3 | Chromium | 10 | ug/L | U | 2 | 10 | 10 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7439−95−4 | Magnesium | 6710 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7439−98−7 | Molybdenum | 0.598 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7440−02−0 | Nickel | 1.14 | ug/L | J | 0.5 | 2 | 2 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7440−09−7 | Potassium | 2930 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7631−86−9 | Silica | 62500 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7440−23−5 | Sodium | 47300 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−24−6 | Strontium | 532 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 07/16/14 05:22 | 140715−3 | 1397300 |
| 7440−31−5 | Tin | 200 | ug/L | U | 50 | 200 | 200 | 20 | P | HSC | 07/15/14 13:53 | 071514−2 | 1397305 |
| 7440−61−1 | Uranium | 1.85 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 07/16/14 14:52 | 140716−4 | 1397300 |
| 7440−62−2 | Vanadium | 7.76 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 06/30/14 16:18 | 063014B−1 | 1397305 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3574 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 350951008 **BASIS:** As Received **DATE COLLECTED** 17−JUN−14

**CLIENT ID:** CALA−14−79464 **LEVEL:** Low **DATE RECEIVED** 19−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 187 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | BCD1 | 07/17/14 11:27 | | 1404141 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1397300 | 1397299 | SW846 3005A | 50 | mL | 50 | mL | 06/20/14 | JXO1 |
| 1397305 | 1397304 | SW846 3005A | 50 | mL | 50 | mL | 06/20/14 | JXO1 |
| 1398324 | 1398323 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 06/24/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3574 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 350951019 **BASIS:** As Received **DATE COLLECTED** 17−JUN−14

**CLIENT ID:** CALA−14−79447 **LEVEL:** Low **DATE RECEIVED** 19−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 06/25/14 15:43 | 062514W2−5 | 1398324 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1398324 | 1398323 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 06/24/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3574 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 350951022 **BASIS:** As Received **DATE COLLECTED** 17−JUN−14

**CLIENT ID:** CALA−14−79448 **LEVEL:** Low **DATE RECEIVED** 19−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 06/25/14 15:45 | 062514W2−5 | 1398324 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−3574 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 350951022 **BASIS:** As Received **DATE COLLECTED** 17−JUN−14

**CLIENT ID:** CALA−14−79448 **LEVEL:** Low **DATE RECEIVED** 19−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7440−38−2 | Arsenic | 5 | ug/L | U | 1.7 | 5 | 5 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7440−39−3 | Barium | 181 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−42−8 | Boron | 68.8 | ug/L | | 15 | 50 | 50 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7440−70−2 | Calcium | 63400 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−47−3 | Chromium | 10 | ug/L | U | 2 | 10 | 10 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7439−95−4 | Magnesium | 6650 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7439−98−7 | Molybdenum | 0.638 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7440−02−0 | Nickel | 1.19 | ug/L | J | 0.5 | 2 | 2 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7440−09−7 | Potassium | 2900 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7631−86−9 | Silica | 63200 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7440−23−5 | Sodium | 46900 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−24−6 | Strontium | 533 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 07/16/14 05:55 | 140715−3 | 1397300 |
| 7440−31−5 | Tin | 200 | ug/L | U | 50 | 200 | 200 | 20 | P | HSC | 07/15/14 13:50 | 071514−2 | 1397305 |
| 7440−61−1 | Uranium | 1.87 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 07/16/14 15:04 | 140716−4 | 1397300 |
| 7440−62−2 | Vanadium | 8.01 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 06/30/14 16:15 | 063014B−1 | 1397305 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3574 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 350951022 **BASIS:** As Received **DATE COLLECTED** 17−JUN−14

**CLIENT ID:** CALA−14−79448 **LEVEL:** Low **DATE RECEIVED** 19−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 186 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | BCD1 | 07/17/14 11:27 | | 1404141 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1397300 | 1397299 | SW846 3005A | 50 | mL | 50 | mL | 06/20/14 | JXO1 |
| 1397305 | 1397304 | SW846 3005A | 50 | mL | 50 | mL | 06/20/14 | JXO1 |
| 1398324 | 1398323 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 06/24/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2014−3574

**Contract:** ESHL00714

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203112561 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203112571 | | | | | | | | |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 50 | ug/L | +/−150 | U | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 116 | ug/L | +/−300 | J | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| 1203115078 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3574 **Client ID** CALA−14−79464S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 350951008 **Spike ID:** 1203112564

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | 75−125 | 53 | | 1 | U | 50 | 106 | | MS |
| Arsenic | ug/L | 75−125 | 48.1 | | 1.7 | U | 50 | 96.3 | | MS |
| Cadmium | ug/L | 75−125 | 52 | | 0.11 | U | 50 | 104 | | MS |
| Chromium | ug/L | 75−125 | 49.4 | | 2 | U | 50 | 98.9 | | MS |
| Lead | ug/L | 75−125 | 52 | | 0.5 | U | 50 | 104 | | MS |
| Molybdenum | ug/L | 75−125 | 52.8 | | 0.598 | | 50 | 104 | | MS |
| Nickel | ug/L | 75−125 | 51 | | 1.14 | J | 50 | 99.7 | | MS |
| Selenium | ug/L | 75−125 | 48.9 | | 1.5 | U | 50 | 97.7 | | MS |
| Silver | ug/L | 75−125 | 53.3 | | 0.2 | U | 50 | 107 | | MS |
| Thallium | ug/L | 75−125 | 47.8 | | 0.45 | U | 50 | 95.5 | | MS |
| Uranium | ug/L | 75−125 | 50 | | 1.85 | | 50 | 96.3 | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3574 **Client ID** CALA−14−79464S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 350951008 **Spike ID:** 1203112574

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Beryllium | ug/L | 75−125 | 498 | | 1 | U | 500 | 99.6 | | P |
| Boron | ug/L | 75−125 | 562 | | 66.7 | | 500 | 99.1 | | P |
| Calcium | ug/L | | 67900 | | 64000 | | 5000 | 76.6 | N/A | P |
| Cobalt | ug/L | 75−125 | 481 | | 1 | U | 500 | 96.2 | | P |
| Copper | ug/L | 75−125 | 513 | | 3 | U | 500 | 103 | | P |
| Iron | ug/L | 75−125 | 5130 | | 30 | U | 5000 | 102 | | P |
| Magnesium | ug/L | 75−125 | 11800 | | 6710 | | 5000 | 101 | | P |
| Manganese | ug/L | 75−125 | 491 | | 2 | U | 500 | 98.3 | | P |
| Potassium | ug/L | 75−125 | 7670 | | 2930 | | 5000 | 94.9 | | P |
| Silica | ug/L | | 71300 | | 62500 | | 10700 | 82.3 | N/A | P |
| Sodium | ug/L | | 51000 | | 47300 | | 5000 | 74 | N/A | P |
| Strontium | ug/L | 75−125 | 1020 | | 532 | | 500 | 97.6 | | P |
| Tin | ug/L | 75−125 | 421 | | 50 | U | 500 | 84.1 | | P |
| Vanadium | ug/L | 75−125 | 534 | | 7.76 | | 500 | 105 | | P |
| Zinc | ug/L | 75−125 | 492 | | 3.3 | U | 500 | 98.4 | | P |
| Barium | ug/L | 75−125 | 668 | | 179 | | 500 | 97.8 | | P |
| Aluminum | ug/L | 75−125 | 4860 | | 68 | U | 5000 | 96.4 | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3574 **Client ID** WTRON−14−79963S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** STORM WATER **% Solids:**

**Sample ID:** 350760005 **Spike ID:** 1203115084

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 1.88 | | 0.067 | U | 2 | 94.1 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3574 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CALA−14−79464D

**Matrix:** WATER **Level:** Low

**Sample ID:** 350951008 **Duplicate ID:** 1203112563 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | | 1.7 | U | 1.7 | U | | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | | 2 | U | 2 | U | | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 0.598 | | 0.604 | | .998 | | MS |
| Nickel | ug/L | +/−2 | 1.14 | J | 1.17 | J | 2.34 | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−20% | 1.85 | | 1.81 | | 2.14 | | MS |

***Analytical Methods:**

**MS SW846 3005A/6020A**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3574 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CALA−14−79464D

**Matrix:** WATER **Level:** Low

**Sample ID:** 350951008 **Duplicate ID:** 1203112573 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−20% | 179 | | 174 | | 2.72 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | +/−50 | 66.7 | | 65.3 | | 2.2 | | P |
| Calcium | ug/L | +/−20% | 64000 | | 61800 | | 3.51 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−20% | 6710 | | 6520 | | 2.77 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 2930 | | 2810 | | 4.17 | | P |
| Silica | ug/L | +/−20% | 62500 | | 61200 | | 2.05 | | P |
| Sodium | ug/L | +/−20% | 47300 | | 46000 | | 2.72 | | P |
| Strontium | ug/L | +/−20% | 532 | | 520 | | 2.31 | | P |
| Tin | ug/L | | 50 | U | 50 | U | | | P |
| Vanadium | ug/L | +/−5 | 7.76 | | 7.56 | | 2.58 | | P |
| Zinc | ug/L | | 3.3 | U | 3.3 | U | | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3574 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** WTRON−14−79963D

**Matrix:** STORM WATER **Level:** Low

**Sample ID:** 350760005 **Duplicate ID:** 1203115083 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3574

**Contract:** ESHL00714

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203112562 | | | | | | | | |
| | Antimony | ug/L | 50 | 51.1 | | 102 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 48.7 | | 97.4 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 50.4 | | 101 | 80−120 | MS |
| | Chromium | ug/L | 50 | 49.8 | | 99.5 | 80−120 | MS |
| | Lead | ug/L | 50 | 52.7 | | 105 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 50.1 | | 100 | 80−120 | MS |
| | Nickel | ug/L | 50 | 52.8 | | 106 | 80−120 | MS |
| | Selenium | ug/L | 50 | 51.4 | | 103 | 80−120 | MS |
| | Silver | ug/L | 50 | 52.1 | | 104 | 80−120 | MS |
| | Thallium | ug/L | 50 | 49.4 | | 98.8 | 80−120 | MS |
| | Uranium | ug/L | 50 | 45.3 | | 90.6 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3574

**Contract:** ESHL00714

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203112572 | | | | | | | | |
| | Calcium | ug/L | 5000 | 5100 | | 102 | 80−120 | P |
| | Cobalt | ug/L | 500 | 503 | | 101 | 80−120 | P |
| | Copper | ug/L | 500 | 499 | | 99.8 | 80−120 | P |
| | Iron | ug/L | 5000 | 5220 | | 104 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 5340 | | 107 | 80−120 | P |
| | Manganese | ug/L | 500 | 510 | | 102 | 80−120 | P |
| | Potassium | ug/L | 5000 | 4940 | | 98.8 | 80−120 | P |
| | Silica | ug/L | 10700 | 10500 | | 97.8 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5210 | | 104 | 80−120 | P |
| | Strontium | ug/L | 500 | 502 | | 100 | 80−120 | P |
| | Tin | ug/L | 500 | 514 | | 103 | 80−120 | P |
| | Vanadium | ug/L | 500 | 527 | | 105 | 80−120 | P |
| | Zinc | ug/L | 500 | 506 | | 101 | 80−120 | P |
| | Aluminum | ug/L | 5000 | 4920 | | 98.3 | 80−120 | P |
| | Barium | ug/L | 500 | 506 | | 101 | 80−120 | P |
| | Beryllium | ug/L | 500 | 501 | | 100 | 80−120 | P |
| | Boron | ug/L | 500 | 486 | | 97.2 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3574

**Contract:** ESHL00714

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203115079 | | | | | | | | |
| | Mercury | ug/L | 2 | 1.91 | | 95.4 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3574 **Client ID** CALA−14−79464L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 350951008 **Serial Dilution ID:** 1203112565

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 1.7 | U | 8.5 | U | | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 2 | U | 10 | U | | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | .598 | | .825 | U | 100 | | | MS |
| Nickel | 1.14 | J | 2.5 | U | 100 | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | 1.85 | | 1.81 | | 1.95 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3574 **Client ID** CALA−14−79464L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 350951008 **Serial Dilution ID:** 1203112575

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 179 | | 174 | | 2.99 | | 10 | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 66.7 | | 81.2 | J | 21.7 | | | P |
| Calcium | 64000 | | 61800 | | 3.54 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 6710 | | 6350 | | 5.36 | | 10 | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 2930 | | 2690 | | 8.03 | | 10 | P |
| Silica | 62500 | | 60700 | | 2.86 | | 10 | P |
| Sodium | 47300 | | 46800 | | 1.11 | | 10 | P |
| Strontium | 532 | | 513 | | 3.49 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 7.76 | | 7.81 | J | .708 | | | P |
| Zinc | 3.3 | U | 16.5 | U | | | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3574 **Client ID** WTRON−14−79963L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 350760005 **Serial Dilution ID:** 1203115085

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1397532 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203113154 | Method Blank (MB) |
| 1203113155 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203113157 | 350951005(CALA-14-79458) Post Spike (PS) |
| 1203113159 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 350951005 (CALA-14-79458).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages

electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1397084 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1397082 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203112036 | Method Blank (MB) |
| 1203112039 | Laboratory Control Sample (LCS) |
| 1203113067 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203113068 | 350951005(CALA-14-79458) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 350951005 (CALA-14-79458).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203113068 (CALA-14-79458).

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203113067 (CALA-14-79458).

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203112039 (LCS). The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203112036 (MB), 1203112039 (LCS), 1203113067 (CALA-14-79458), 1203113068 (CALA-14-79458), 350951005 (CALA-14-79458) and 350951019 (CALA-14-79447).

## Miscellaneous Information

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1307560. 1203113068 (CALA-14-79458).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1397348 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203112699 | Method Blank (MB) |
| 1203112700 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203112701 | 350951008(CALA-14-79464) Post Spike (PS) |
| 1203112702 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 22.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 350951008 (CALA-14-79464).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203112701 (CALA-14-79464).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203112700 (CALA-14-79464), 1203112701 (CALA-14-79464), 350951008 (CALA-14-79464) and 350951022 (CALA-14-79448).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1309539. 1203112701 (CALA-14-79464).

**Manual Integrations**
The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203112700 (CALA-14-79464), 1203112701 (CALA-14-79464), 350951008 (CALA-14-79464) and 350951022 (CALA-14-79448).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1397518 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1397517 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203113114 | Method Blank (MB) |
| 1203113115 | 350774001(WST03-14-67206) Sample Duplicate (DUP) |
| 1203113116 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203113119 | 350774001(WST03-14-67206) Matrix Spike (MS) |
| 1203113120 | 350951008(CALA-14-79464) Matrix Spike (MS) |
| 1203113123 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 350774001 (WST03-14-67206) and 350951008 (CALA-14-79464).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1397514 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1397513 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203113090 | Method Blank (MB) |
| 1203113091 | 350748001(VS-R28-V2-79984) Sample Duplicate (DUP) |
| 1203113094 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203113096 | 350748001(VS-R28-V2-79984) Matrix Spike (MS) |
| 1203113099 | 350951005(CALA-14-79458) Matrix Spike (MS) |
| 1203113101 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 350748001 (VS-R28-V2-79984) and 350951005 (CALA-14-79458).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203113096 (VS-R28-V2-79984).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203113091 (VS-R28-V2-79984). The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203113094 (CALA-14-79458).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1307759. 1203113091 (VS-R28-V2-79984) and 1203113096 (VS-R28-V2-79984).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1397522 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203113134 | Method Blank (MB) |
| 1203113135 | 350774001(WST03-14-67206) Sample Duplicate (DUP) |
| 1203113137 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203113138 | 350774001(WST03-14-67206) Post Spike (PS) |
| 1203113140 | 350951008(CALA-14-79464) Post Spike (PS) |
| 1203113141 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 350774001 (WST03-14-67206) and 350951008 (CALA-14-79464).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203113135 (WST03-14-67206) and 1203113138 (WST03-14-67206).

**Sample Re-analysis**
The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203113135 (WST03-14-67206) and 1203113138 (WST03-14-67206).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1397516 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1397515 | **Method:** | EEPA 365.4 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203113102 | Method Blank (MB) |
| 1203113103 | 350748001(VS-R28-V2-79984) Sample Duplicate (DUP) |
| 1203113104 | 350774001(WST03-14-67206) Sample Duplicate (DUP) |
| 1203113106 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203113108 | 350748001(VS-R28-V2-79984) Matrix Spike (MS) |
| 1203113109 | 350774001(WST03-14-67206) Matrix Spike (MS) |
| 1203113111 | 350951008(CALA-14-79464) Matrix Spike (MS) |
| 1203113113 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 350748001 (VS-R28-V2-79984), 350774001 (WST03-14-67206) and 350951008 (CALA-14-79464).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The sample concentration is more than four times the spike nominal concentration; therefore, the spike recovery is not applicable. 1203113109 (WST03-14-67206).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203113104 (WST03-14-67206).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203113104 (WST03-14-67206) and 1203113109 (WST03-14-67206).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1307850. 1203113104 (WST03-14-67206).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1398055 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203114531 | Method Blank (MB) |
| 1203114532 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203114536 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 350951008 (CALA-14-79464).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1400986 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203121763 | Laboratory Control Sample (LCS) |
| 1203121764 | 351059008(CALA-14-79466) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1400108 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203119756 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203119758 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a Thermo Orion Star A111. Immediates

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1311210. 350951008 (CALA-14-79464) and 350951022 (CALA-14-79448).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1399451 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 350951008 | CALA-14-79464 |
| 350951022 | CALA-14-79448 |
| 1203117903 | Method Blank (MB) |
| 1203117907 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203117912 | 350951008(CALA-14-79464) Matrix Spike (MS) |
| 1203117915 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 350951008 (CALA-14-79464).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____16July14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

H  Analytical holding time was exceeded

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: July 16, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2014-3574

Client Sample ID: CALA-14-79458
Sample ID: 350951005
Matrix: W
Collect Date: 17-JUN-14 11:04
Receive Date: 19-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 1.35 | 0.330 | 1.00 | mg/L | 1 | TSM | 06/20/14 | 2244 | 1397532 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 06/24/14 | 0855 | 1397084 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1 | KLP1 | 06/24/14 | 1216 | 1397514 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 06/23/14 | 1102 | 1397082 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 06/23/14 | 1700 | 1397513 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 16, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2014-3574

Client Sample ID: CALA-14-79464
Sample ID: 350951008
Matrix: W
Collect Date: 17-JUN-14 11:04
Receive Date: 19-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | | 0.248 | 0.067 | 0.200 | mg/L | 1 | RXB5 | 06/21/14 | 0301 | 1397348 | 1 |
| Fluoride | | 0.299 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 20.0 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Chloride | | 43.4 | 0.670 | 2.00 | mg/L | 10 | RXB5 | 06/23/14 | 2016 | 1397348 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 06/25/14 | 1242 | 1397518 | 3 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.496 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 06/26/14 | 1314 | 1397522 | 4 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | J | 0.032 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 06/24/14 | 1409 | 1397516 | 5 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 377 | 3.40 | 14.3 | mg/L | | MXB3 | 06/24/14 | 1040 | 1398055 | 6 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 17.2C | H | 8.05 | 0.010 | 0.100 | SU | 1 | SXC5 | 07/03/14 | 1154 | 1400108 | 7 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 203 | 0.725 | 1.00 | mg/L | | PXO1 | 06/28/14 | 1659 | 1399451 | 8 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 574 | 1.00 | 1.00 | umhos/cm | 1 | SXC5 | 07/07/14 | 1401 | 1400986 | 9 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 06/25/14 | 1105 | 1397517 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 06/23/14 | 1700 | 1397515 |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 16, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2014-3574 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CALA-14-79464 | Project: | ESHL00714 |
| Sample ID: | 350951008 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 300.0 | |
| 3 | EPA 350.1 | |
| 4 | EPA 353.2 | |
| 5 | EPA 365.4 | |
| 6 | EPA 160.1 | |
| 7 | EPA 150.1 | |
| 8 | EPA 310.1 | |
| 9 | EPA 120.1 | |

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 16, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2014-3574

Client Sample ID: CALA-14-79447
Sample ID: 350951019
Matrix: W
Collect Date: 17-JUN-14 11:04
Receive Date: 19-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 1.46 | 0.330 | 1.00 | mg/L | 1 | TSM | 06/20/14 | 2346 | 1397532 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 06/24/14 | 0902 | 1397084 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.184 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 06/24/14 | 1219 | 1397514 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 06/23/14 | 1102 | 1397082 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 06/23/14 | 1700 | 1397513 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: July 16, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2014-3574

Client Sample ID: CALA-14-79448
Sample ID: 350951022
Matrix: W
Collect Date: 17-JUN-14 11:04
Receive Date: 19-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | | 0.242 | 0.067 | 0.200 | mg/L | 1 | RXB5 | 06/21/14 | 0431 | 1397348 | 1 |
| Fluoride | | 0.319 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 19.9 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Chloride | | 44.1 | 0.670 | 2.00 | mg/L | 10 | RXB5 | 06/23/14 | 2146 | 1397348 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.0509 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 06/25/14 | 1244 | 1397518 | 3 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.054 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 06/26/14 | 1326 | 1397522 | 4 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | J | 0.0257 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 06/24/14 | 1412 | 1397516 | 5 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 351 | 3.40 | 14.3 | mg/L | | MXB3 | 06/24/14 | 1040 | 1398055 | 6 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 16.9C | H | 7.22 | 0.010 | 0.100 | SU | 1 | SXC5 | 07/03/14 | 1200 | 1400108 | 7 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 200 | 0.725 | 1.00 | mg/L | | PXO1 | 06/28/14 | 1708 | 1399451 | 8 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 577 | 1.00 | 1.00 | umhos/cm | 1 | SXC5 | 07/07/14 | 1403 | 1400986 | 9 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 06/25/14 | 1105 | 1397517 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 06/23/14 | 1700 | 1397515 |

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: July 16, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2014-3574 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CALA-14-79448 | Project: | ESHL00714 |
| Sample ID: | 350951022 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 300.0 | |
| 3 | EPA 350.1 | |
| 4 | EPA 353.2 | |
| 5 | EPA 365.4 | |
| 6 | EPA 160.1 | |
| 7 | EPA 150.1 | |
| 8 | EPA 310.1 | |
| 9 | EPA 120.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: July 16, 2014



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **350951**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | | |
| Batch 1397532 | | | | | | | | | | | | |
| QC1203113155 350951005 DUP | | | | | | | | | | | | |
| Total Organic Carbon Average | | | 1.35 | | 1.33 | mg/L | 1.94 | ^ | | (+/-1.00) | TSM | 06/20/14 23:18 |
| QC1203113159 LCS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 9.83 | mg/L | | | 98.3 | (85%-115%) | | 06/20/14 18:39 |
| QC1203113154 MB | | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | | 06/20/14 18:30 |
| QC1203113157 350951005 PS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | 1.35 | | 11.5 | mg/L | | | 101 | (65%-120%) | | 06/20/14 23:37 |
| **Flow Injection Analysis** | | | | | | | | | | | | |
| Batch 1397084 | | | | | | | | | | | | |
| QC1203113067 350951005 DUP | | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | | AXH3 | 06/24/14 08:56 |
| QC1203112039 LCS | | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 54.8 | ug/L | | | 110 | (90%-110%) | | 06/24/14 09:01 |
| QC1203112036 MB | | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | | 06/24/14 08:50 |
| QC1203113068 350951005 MS | | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 115 | ug/L | | | 114* | (90%-110%) | | 06/24/14 08:57 |
| **Ion Chromatography** | | | | | | | | | | | | |
| Batch 1397348 | | | | | | | | | | | | |
| QC1203112700 350951008 DUP | | | | | | | | | | | | |
| Bromide | | | 0.248 | | 0.243 | mg/L | 1.79 | ^ | | (+/-0.200) | RXB5 | 06/21/14 03:31 |
| Chloride | | | 43.4 | | 43.8 | mg/L | 0.886 | | | (0%-20%) | | 06/23/14 20:46 |
| Fluoride | | | 0.299 | | 0.300 | mg/L | 0.300 | ^ | | (+/-0.100) | | 06/21/14 03:31 |
| Sulfate | | | 20.0 | | 19.9 | mg/L | 0.279 | | | (0%-20%) | | |
| QC1203112702 LCS | | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.29 | mg/L | | | 103 | (90%-110%) | | 06/21/14 02:31 |
| Chloride | 5.00 | | | | 4.87 | mg/L | | | 97.5 | (90%-110%) | | |

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## QC Summary

**Workorder:** **350951**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1397348 | | | | | | | | | | | |
| Fluoride | 2.50 | | | | 2.45 | mg/L | | 98 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 9.84 | mg/L | | 98.4 | (90%-110%) | RXB5 | 06/21/14 02:31 |
| QC1203112699 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 06/21/14 02:01 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203112701 350951008 PS | | | | | | | | | | | |
| Bromide | 1.25 | | 0.248 | | 1.52 | mg/L | | 101 | (90%-110%) | | 06/21/14 04:01 |
| Chloride | 5.00 | | 4.34 | | 9.82 | mg/L | | 110 | (90%-110%) | MAR1 | 06/26/14 14:21 |
| Fluoride | 2.50 | | 0.299 | | 2.88 | mg/L | | 103 | (90%-110%) | RXB5 | 06/21/14 04:01 |
| Sulfate | 10.0 | | 20.0 | | 32.2 | mg/L | | 122* | (90%-110%) | | |
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1397514 | | | | | | | | | | | |
| QC1203113091 350748001 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | 0.159 | U | ND | mg/L | 241*^ | | (+/-0.100) | KLP1 | 06/24/14 12:02 |
| QC1203113094 350951005 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | | | 06/24/14 12:17 |
| QC1203113101 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 0.934 | mg/L | | 93.4 | (90%-110%) | | 06/24/14 12:00 |
| QC1203113090 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | J | 0.0414 | mg/L | | | | | 06/24/14 11:59 |
| QC1203113096 350748001 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | 0.159 | | 0.886 | mg/L | | 72.7* | (90%-110%) | | 06/24/14 12:03 |
| QC1203113099 350951005 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 0.960 | mg/L | | 96 | (90%-110%) | | 06/24/14 12:18 |
| Batch 1397516 | | | | | | | | | | | |
| QC1203113103 350748001 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | J | 0.0188 | J | 0.0225 | mg/L | 17.9 ^ | | (+/-0.050) | KLP1 | 06/24/14 13:57 |

## QC Summary

**Workorder:** **350951**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1397516 | | | | | | | | | | | |
| QC1203113104 350774001 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | | 7.63 | | 5.12 | mg/L | 39.4* | | (0%-20%) | KLP1 | 06/24/14 14:24 |
| QC1203113106 350951008 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | J | 0.032 | J | 0.0325 | mg/L | 1.55 ^ | | (+/-0.050) | | 06/24/14 14:10 |
| QC1203113113 LCS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 0.992 | mg/L | | 99.2 | (79%-126%) | | 06/24/14 13:55 |
| QC1203113102 MB | | | | | | | | | | | |
| Phosphorus, Total as P | | | | U | ND | mg/L | | | | | 06/24/14 13:54 |
| QC1203113108 350748001 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | J | 0.0188 | | 1.13 | mg/L | | 111 | (64%-134%) | | 06/24/14 13:58 |
| QC1203113109 350774001 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | 7.63 | | 4.16 | mg/L | | N/A | (64%-134%) | | 06/24/14 14:25 |
| QC1203113111 350951008 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | J | 0.032 | | 1.06 | mg/L | | 103 | (64%-134%) | | 06/24/14 14:11 |
| Batch 1397518 | | | | | | | | | | | |
| QC1203113115 350774001 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | | 0.498 | | 0.579 | mg/L | 15.0 | | (0%-20%) | KLP1 | 06/25/14 12:32 |
| QC1203113116 350951008 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | U | ND | U | ND | mg/L | N/A | | | | 06/25/14 12:42 |
| QC1203113123 LCS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 1.02 | mg/L | | 102 | (90%-110%) | | 06/25/14 12:30 |
| QC1203113114 MB | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | U | ND | mg/L | | | | | 06/25/14 12:29 |
| QC1203113119 350774001 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | 0.498 | | 1.51 | mg/L | | 101 | (90%-110%) | | 06/25/14 12:33 |
| QC1203113120 350951008 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | U | ND | | 1.04 | mg/L | | 103 | (90%-110%) | | 06/25/14 12:43 |
| Batch 1397522 | | | | | | | | | | | |
| QC1203113135 350774001 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 11.1 | | 9.20 | mg/L | 18.3 ^ | | (+/-2.50) | KLP1 | 06/26/14 14:10 |
| QC1203113137 350951008 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 0.496 | | 0.496 | mg/L | 0.00 | | (0%-20%) | | 06/26/14 13:16 |
| QC1203113141 LCS | | | | | | | | | | | |

## QC Summary

**Workorder: 350951**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1397522 | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 0.947 | mg/L | | 94.7 | (90%-110%) | | 06/26/14 12:13 |
| QC1203113134 MB | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | | J | 0.0281 | mg/L | | | | KLP1 | 06/26/14 12:12 |
| QC1203113138 350774001 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.221 | | 1.20 | mg/L | | 97.9 | (90%-110%) | | 06/26/14 14:11 |
| QC1203113140 350951008 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.496 | | 1.52 | mg/L | | 102 | (90%-110%) | | 06/26/14 13:17 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1398055 | | | | | | | | | | | |
| QC1203114532 350951008 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 377 | | 377 | mg/L | 0.760 | | (0%-10%) | MXB3 | 06/24/14 10:40 |
| QC1203114536 LCS | | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | | 294 | mg/L | | 98.1 | (95%-105%) | | 06/24/14 10:40 |
| QC1203114531 MB | | | | | | | | | | | |
| Total Dissolved Solids | | | | U | ND | mg/L | | | | | 06/24/14 10:40 |
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1399451 | | | | | | | | | | | |
| QC1203117907 350951008 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | 203 | | 202 | mg/L | 0.506 | | (0%-20%) | PXO1 | 06/28/14 17:02 |
| Carbonate alkalinity (CaCO3) | | U | ND | U | ND | mg/L | N/A | | | | |
| QC1203117915 LCS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | | 50.3 | mg/L | | 101 | (90%-110%) | | 06/28/14 16:36 |
| QC1203117903 MB | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | | U | ND | mg/L | | | | | 06/28/14 16:36 |
| Carbonate alkalinity (CaCO3) | | | | U | ND | mg/L | | | | | |
| QC1203117912 350951008 MS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | 203 | | 251 | mg/L | | N/A | (80%-120%) | | 06/28/14 17:05 |
| Batch 1400108 | | | | | | | | | | | |
| QC1203119756 350951008 DUP | | | | | | | | | | | |
| pH | | H | 8.05 | H | 8.06 | SU | 0.124 | | (0%-10%) | SXC5 | 07/03/14 11:57 |
| QC1203119758 LCS | | | | | | | | | | | |
| pH | 7.00 | | | | 6.99 | SU | | 99.9 | (99%-101%) | | 07/03/14 11:32 |

## QC Summary

**Workorder:** **350951**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1400986 | | | | | | | | | | | |
| QC1203121764 351059008 DUP | | | | | | | | | | | |
| Conductivity | | 299 | | 299 | umhos/cm | 0.00 | | (0%-10%) | SXC5 | 07/07/14 | 14:04 |
| QC1203121763 LCS | | | | | | | | | | | |
| Conductivity | 1410 | | | 1350 | umhos/cm | | 95.5 | (95%-105%) | | 07/07/14 | 13:57 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 24-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 335.4, SW846 9012B | Liquid | ESHL, UCOR |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397084 | See Below | | |

**Potentially affected work order(s)(SDG): 350892,350951(2014-3574),351053,351059(2014-3584)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203112038MS,1203113068MS | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference. 1203112038MS<br>The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203113068MS |

**Originator's Name:**

Aubrey Kingsbury 24-JUN-14

**Data Validator/Group Leader:**

Kristen Parson 24-JUN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 24-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 351.2, EPA 351.2 SC | Liquid | AECM, BETT, BRKL, ESHL, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397514 | See Below | | |

**Potentially affected work order(s)(SDG):** **349867(34201),350748(2014-3561),350845(14066263),350951(2014-3574),350966(LMP14029013A_WCH),351059(2014-3584)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br>QC 1203113096MS,1203113097MS,<br>1203113098MS,<br>1203113100MS<br>2. Failed RPD for DUP:<br>QC 1203113091DUP,<br>1203113092DUP,<br>1203113093DUP,<br>1203113095DUP | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference.<br>2. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 24-JUN-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 24-JUN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 24-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 365.4 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397516 | See Below | | |

**Potentially affected work order(s)(SDG): 350748(2014-3561),350774(2014-3565),350951(2014-3574),351059(2014-3584)**

**Application Issues:**

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203113104DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 24-JUN-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 24-JUN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 28-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| IC | EPA 300.0 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397348 | See Below | | |

**Potentially affected work order(s)(SDG): 350951(2014-3574)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203112701PS | 1. The MS/PS mixture contains seven anions of interest. Of those, all requested anions except sulfate met normal acceptance criteria for recovery (90 - 110%). This failure is attributed to the matrix of the sample because the successful recovery of the other compounds indicate that the laboratory process was in control. This variance is judged to have no negative impact on the data. The deviation is noted in the Case Narrative and DER, and the data has been reported. |

**Originator's Name:**

Mary Sherwood 28-JUN-14

**Data Validator/Group Leader:**

Thomas Lewis 16-JUL-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 03-JUL-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ELECTRODE | See Below | Liquid | BETT, DMAX, ESHL, HMSA, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1400108 | See Below | | |

**Potentially affected work order(s)(SDG):** **350760(2014-3562),350854,350951(2014-3574),351059(2014-3584),351120(X0060),351139(2014-3591),351445,351468,351482,351554(GEL351554),351636,351695(GEL351695)**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| Test/Methods: EPA 150.1, SM 4500-H B, SW846 9040B/9040C, SW846 9040C<br><br>1. Sample received out of holding:<br><br>350760 001,003<br>350854 002,006,010<br>350951 008,022<br>351059 008<br>351120 001<br>351139 010<br>351445 001<br>351468 001<br>351482 002<br>351554 001,002,003<br>351636 001,002,004<br>351695 001 | 1. Samples were received by laboratory outside of method specified holding time. |

**Originator's Name:**
Sarah Carson 03-JUL-14

**Data Validator/Group Leader:**
Elzbieta Szulc 03-JUL-14

# Radiological Analysis

**Radiochemistry Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3574**
**Work Order 350951**

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec U, Liquid** |
| Analytical Method: | DOE EML HASL-300, U-02-RC Modified |
| Analytical Batch Number: | 1397164 |

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203112268 | Method Blank (MB) |
| 1203112269 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203112270 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203112268 (MB) and 1203112270 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 350951005 (CALA-14-79458). The QC was from ARSL work order 350951.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Am241 Liquid** |
| Analytical Method: | DOE EML HASL-300, Am-05-RC Modified |
| Analytical Batch Number: | 1398720 |

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203116111 | Method Blank (MB) |

1203116112 351059005(CALA-14-79460) Sample Duplicate (DUP)
1203116113 Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203116111 (MB) and 1203116113 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 351059005 (CALA-14-79460). The QC was from ARSL work order 351059.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
Samples were reprepped due to high blank activity. The re-analysis is being reported.

**Recounts**
Samples 1203116112 (CALA-14-79460), 350951005 (CALA-14-79458) and 350951019 (CALA-14-79447) were recounted due to high MDCs. The recounts are reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Pu, Liquid** |
| Analytical Method: | DOE EML HASL-300, Pu-11-RC Modified |
| Analytical Batch Number: | 1398721 |

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203116114 | Method Blank (MB) |
| 1203116115 | 351059005(CALA-14-79460) Sample Duplicate (DUP) |
| 1203116116 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203116114 (MB) and 1203116116 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 351059005 (CALA-14-79460). The QC was from ARSL work order 351059.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
The batch was reprepped due to suspected contamination. The re-analysis is reported.

**Recounts**
Sample 1203116114 (MB) was recounted twice due to a peak shift and poor resolution and was then given additional clean-up steps and recounted in order to improve the resolution. The fourth count is reported. Sample 350951019 (CALA-14-79447) was recounted due to a high MDC and then due to poor resolution. The sample was then given additional clean-up steps and recounted in order to improve the resolution. Due to a low tracer yield recovery after the clean-up steps the third count is reported. Sample 1203116115 (CALA-14-79460) was recounted due to high MDCs. The sample was then given additional clean-up steps and recounted in order to improve the resolution. Due to a low tracer yield recovery after the clean-up steps the second count is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1313789 was generated due to Other and Peak Centroid Values Off. 1. Samples 350951019 and 351059005 do not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 2. The Pu-242 tracer peak centroid for sample 350951019 is greater than 50 keV from the expected energy value of 4890 keV. 1. The samples do meet the tracer yield requirement, the detection limits, and their tracer peaks are within the Pu-242 region of interest. Reporting results. 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population. Sample 1203116115 (CALA-14-79460) did not meet the client’s yield requirement. However, there are 400 tracer counts, GEL’s standard tracer yield requirements are met, and the client’s detection limits are met.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Gammaspec** |
| Analytical Method: | EPA 901.1 |
| Analytical Batch Number: | 1397133 |

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203112193 | Method Blank (MB) |
| 1203112194 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203112195 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibrations were performed in July 2013, August 2013, November 2013 and June 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
The blank volume is representative of the sample volume in this batch.

**Designated QC**
The following sample was used for QC: 350951005 (CALA-14-79458). The QC was from ARSL work order

350951.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank 1203112193 (MB) result is greater than 1.65 times the CSU but less than the MDC for K-40.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
Additional comments were not required for this sample set.

**Blank Decision Level**
The blank 1203112193 (MB) result is greater than the decision level but less than the MDC for K-40.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **GFPC, Sr90, liquid** |
| Analytical Method: | EPA 905.0 Modified |
| Analytical Batch Number: | 1399646 |

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203118495 | Method Blank (MB) |
| 1203118496 | 351467001(CALA-14-79747) Sample Duplicate (DUP) |

| | |
|---|---|
| 1203118497 | 351467001(CALA-14-79747) Matrix Spike (MS) |
| 1203118498 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in March 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203118495 (MB) and 1203118498 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 351467001 (CALA-14-79747). The QC was from ARSL work order 351467.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**
Sample 1203118496 (CALA-14-79747) was recounted due to a suspected false positive. The recount is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike, 1203118497 (CALA-14-79747), aliquot was reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **WSP-GrossA/B** |
| Analytical Method: | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1399669 |

| Sample ID | Client ID |
|---|---|
| 350951005 | CALA-14-79458 |
| 350951019 | CALA-14-79447 |
| 1203118572 | Method Blank (MB) |
| 1203118573 | 351467001(CALA-14-79747) Sample Duplicate (DUP) |
| 1203118574 | 351467001(CALA-14-79747) Matrix Spike (MS) |
| 1203118575 | 351467001(CALA-14-79747) Matrix Spike Duplicate (MSD) |
| 1203118576 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203118572 (MB) and 1203118576 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 351467001 (CALA-14-79747). The QC was from ARSL work order 351467.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank, 1203118572 (MB), beta result is greater than 1.65 times the CSU but less than the MDC.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Gross Alpha/Beta Preparation Information**
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike and matrix spike duplicate, 1203118574 (CALA-14-79747) and 1203118575 (CALA-14-79747), aliquots were reduced to conserve sample volume.

**Blank Decision Level**
The blank, 1203118572 (MB), beta result is greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3574  GEL Work Order: 350951

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Theresa L. Austin  **Name: Theresa Austin**

**Date: 14 JUL 2014**  **Title: Group Leader**

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 14-JUL-14 | Radiochemistry | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ALPHA SPECTROMETER | DOE EML HASL-300, Pu-11-RC Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1398721 | See Below | | |

**Potentially affected work order(s)(SDG): 350951(2014-3574),351059(2014-3584)**

**Application Issues:**

Other

Peak Centroid Values Off

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Samples 350951019 and 351059005 do not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. | 1. The samples do meet the tracer yield requirement, the detection limits, and their tracer peaks are within the Pu-242 region of interest. Reporting results. |
| 2. The Pu-242 tracer peak centroid for sample 350951019 is greater than 50 keV from the expected energy value of 4890 keV. | 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results. |

**Originator's Name:**

Melanie Aycock 14-JUL-14

**Data Validator/Group Leader:**

Kate Gellatly 14-JUL-14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545 Report Date: July 14, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CALA-14-79458
Sample ID: 350951005
Matrix: W
Collect Date: 17-JUN-14
Receive Date: 19-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.00315 | +/-0.00577 | 0.0418 | 0.0181 | +/-0.00577 | 0.050 | pCi/L | | JXR1 | 07/08/14 | 1522 | 1398720 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | -0.00518 | +/-0.00518 | 0.0268 | 0.00987 | +/-0.00518 | 0.050 | pCi/L | | JXR1 | 07/07/14 | 1428 | 1398721 | 2 |
| Plutonium-239/240 | U | 0.0104 | +/-0.00733 | 0.051 | 0.022 | +/-0.00734 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 1.10 | +/-0.0522 | 0.0628 | 0.0281 | +/-0.0876 | 1.00 | pCi/L | | JXR1 | 06/24/14 | 1429 | 1397164 | 3 |
| Uranium-235/236 | U | 0.045 | +/-0.0131 | 0.0526 | 0.0222 | +/-0.0134 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.743 | +/-0.0427 | 0.0353 | 0.0143 | +/-0.0638 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | -1.07 | +/-1.27 | 4.29 | 1.91 | +/-1.29 | 8.00 | pCi/L | | MJH1 | 06/27/14 | 1150 | 1397133 | 4 |
| Cobalt-60 | U | 0.184 | +/-1.38 | 4.98 | 2.16 | +/-1.38 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | 2.55 | +/-2.78 | 10.3 | 4.82 | +/-2.84 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | -1.52 | +/-17.4 | 69.4 | 31.4 | +/-17.4 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | -1.45 | +/-1.05 | 3.46 | 1.41 | +/-1.10 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | 0.123 | +/-0.112 | 0.387 | 0.168 | +/-0.112 | 0.500 | pCi/L | | KSD1 | 07/07/14 | 0959 | 1399646 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | U | 1.15 | +/-0.556 | 1.79 | 0.817 | +/-0.565 | 3.00 | pCi/L | | JXH3 | 07/07/14 | 1238 | 1399669 | 6 |
| Alpha | U | 0.213 | +/-0.559 | 1.95 | 0.903 | +/-0.559 | 3.00 | pCi/L | | JXH3 | 07/10/14 | 1710 | 1399669 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1398720 | 59.9 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1398721 | 84.9 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1397164 | 91.7 | (50%-105%) |

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: July 14, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CALA-14-79458
Sample ID: 350951005

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1399646 | 87.8 | (50%-105%) |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# GEL LABORATORIES LLC

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# Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: July 14, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CALA-14-79447
Sample ID: 350951019
Matrix: W
Collect Date: 17-JUN-14
Receive Date: 19-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.00907 | +/-0.013 | 0.0478 | 0.0208 | +/-0.013 | 0.050 | pCi/L | | JXR1 | 07/08/14 | 1522 | 1398720 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | -0.00229 | +/-0.00397 | 0.0236 | 0.00872 | +/-0.00397 | 0.050 | pCi/L | | JXR1 | 07/09/14 | 1129 | 1398721 | 2 |
| Plutonium-239/240 | U | 0.0137 | +/-0.00793 | 0.045 | 0.0194 | +/-0.00795 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 1.18 | +/-0.0568 | 0.0699 | 0.0313 | +/-0.0951 | 1.00 | pCi/L | | JXR1 | 06/24/14 | 1429 | 1397164 | 3 |
| Uranium-235/236 | U | 0.0334 | +/-0.0125 | 0.0586 | 0.0248 | +/-0.0127 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.708 | +/-0.0441 | 0.0392 | 0.016 | +/-0.0636 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | -0.482 | +/-1.56 | 5.16 | 2.31 | +/-1.57 | 8.00 | pCi/L | | MJH1 | 06/27/14 | 1151 | 1397133 | 4 |
| Cobalt-60 | U | -1.45 | +/-1.51 | 5.40 | 2.31 | +/-1.55 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | 0.930 | +/-2.77 | 10.2 | 4.72 | +/-2.78 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | -9.74 | +/-14.5 | 58.5 | 25.3 | +/-14.7 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | -3.41 | +/-1.40 | 3.81 | 1.52 | +/-1.61 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | 0.0948 | +/-0.113 | 0.397 | 0.174 | +/-0.113 | 0.500 | pCi/L | | KSD1 | 07/07/14 | 0959 | 1399646 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | | 1.95 | +/-0.558 | 1.65 | 0.744 | +/-0.581 | 3.00 | pCi/L | | JXH3 | 07/07/14 | 1259 | 1399669 | 6 |
| Alpha | U | -0.219 | +/-0.633 | 2.25 | 1.05 | +/-0.633 | 3.00 | pCi/L | | JXH3 | 07/10/14 | 1710 | 1399669 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1398720 | 55.7 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1398721 | 70.9 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1397164 | 79.4 | (50%-105%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1399646 | 90.2 | (50%-105%) |

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## Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: July 14, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CALA-14-79447
Sample ID: 350951019

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# Quality Control Data

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

**Report Date: July 14, 2014**


**Client :** **Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**

**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **350951**

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1397164 | | | | | | | | | | |
| QC1203112269 350951005 DUP | | | | | | | | | | |
| Uranium-234 | | 1.10 | | 1.05 | pCi/L | 0.150 | | (0-1) | JXR1 | 06/24/1414:29 |
| | Uncert: | +/-0.0522 | | +/-0.0516 | | | | | | |
| | TPU: | +/-0.0876 | | +/-0.0847 | | | | | | |
| Uranium-235/236 | U | 0.045 | U | 0.0489 | pCi/L | 0.0705 | | (0-1) | | |
| | Uncert: | +/-0.0131 | | +/-0.0137 | | | | | | |
| | TPU: | +/-0.0134 | | +/-0.014 | | | | | | |
| Uranium-238 | | 0.743 | | 0.692 | pCi/L | 0.204 | | (0-1) | | |
| | Uncert: | +/-0.0427 | | +/-0.0418 | | | | | | |
| | TPU: | +/-0.0638 | | +/-0.0609 | | | | | | |
| **Uranium-232 Tracer | 2.74 | 2.51 | | 2.73 | pCi/L | | 99.7 | (50%-105%) | | |
| | Uncert: | +/-0.0822 | | +/-0.0826 | | | | | | |
| | TPU: | +/-0.194 | | +/-0.194 | | | | | | |
| QC1203112270 LCS | | | | | | | | | | |
| Uranium-234 | | | | 2.48 | pCi/L | | | | JXR1 | 06/24/1414:29 |
| | Uncert: | | | +/-0.0717 | | | | | | |
| | TPU: | | | +/-0.175 | | | | | | |
| Uranium-235/236 | | | | 0.133 | pCi/L | | | | | |
| | Uncert: | | | +/-0.0191 | | | | | | |
| | TPU: | | | +/-0.0209 | | | | | | |
| Uranium-238 | 2.72 | | | 2.69 | pCi/L | | 98.9 | (80%-120%) | | |
| | Uncert: | | | +/-0.0747 | | | | | | |
| | TPU: | | | +/-0.188 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.85 | pCi/L | | 84.2 | (50%-105%) | | |
| | Uncert: | | | +/-0.0676 | | | | | | |
| | TPU: | | | +/-0.156 | | | | | | |
| QC1203112268 MB | | | | | | | | | | |
| Uranium-234 | | | U | 0.00 | pCi/L | | | | JXR1 | 06/24/1414:29 |
| | Uncert: | | | +/-0.0054 | | | | | | |
| | TPU: | | | +/-0.0054 | | | | | | |
| Uranium-235/236 | | | U | 0.00 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00385 | | | | | | |
| | TPU: | | | +/-0.00385 | | | | | | |
| Uranium-238 | | | U | -0.00441 | pCi/L | | | | | |
| | Uncert: | | | +/-0.0054 | | | | | | |
| | TPU: | | | +/-0.0054 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.97 | pCi/L | | 89.9 | (50%-105%) | | |
| | Uncert: | | | +/-0.070 | | | | | | |
| | TPU: | | | +/-0.159 | | | | | | |
| Batch 1398720 | | | | | | | | | | |
| QC1203116112 351059005 DUP | | | | | | | | | | |
| Americium-241 | U | 0.00199 | U | 0.0142 | pCi/L | 0.290 | | (0-1) | JXR1 | 07/08/1415:22 |

## QC Summary

**Workorder: 350951**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1398720 | | | | | | | | | | |
| | Uncert: | +/-0.00596 | | +/-0.00591 | | | | | | |
| | TPU: | +/-0.00597 | | +/-0.00594 | | | | | | |
| **Americium-243 Tracer | 2.73 | 1.94 | | 1.99 | pCi/L | | 72.7 | (50%-105%) | | |
| | Uncert: | +/-0.0697 | | +/-0.0696 | | | | | | |
| | TPU: | +/-0.125 | | +/-0.125 | | | | | | |
| QC1203116113 LCS | | | | | | | | | | |
| Americium-241 | 1.41 | | | 1.47 | pCi/L | | 104 | (80%-120%) | JXR1 | 07/07/1414:28 |
| | Uncert: | | | +/-0.0529 | | | | | | |
| | TPU: | | | +/-0.0801 | | | | | | |
| **Americium-243 Tracer | 2.19 | | | 2.23 | pCi/L | | 102 | (50%-105%) | | |
| | Uncert: | | | +/-0.0641 | | | | | | |
| | TPU: | | | +/-0.110 | | | | | | |
| QC1203116111 MB | | | | | | | | | | |
| Americium-241 | | | U | 0.00 | pCi/L | | | | JXR1 | 07/07/1414:27 |
| | Uncert: | | | +/-0.00273 | | | | | | |
| | TPU: | | | +/-0.00273 | | | | | | |
| **Americium-243 Tracer | 2.19 | | | 2.06 | pCi/L | | 94.4 | (50%-105%) | | |
| | Uncert: | | | +/-0.0647 | | | | | | |
| | TPU: | | | +/-0.111 | | | | | | |
| Batch 1398721 | | | | | | | | | | |
| QC1203116115 351059005 DUP | | | | | | | | | | |
| Plutonium-238 | U | 0.00247 | U | -0.00107 | pCi/L | 0.161 | | (0-1) | JXR1 | 07/08/1415:22 |
| | Uncert: | +/-0.00499 | | +/-0.00603 | | | | | | |
| | TPU: | +/-0.00499 | | +/-0.00603 | | | | | | |
| Plutonium-239/240 | U | 0.0102 | U | 0.00623 | pCi/L | 0.119 | | (0-1) | | |
| | Uncert: | +/-0.00932 | | +/-0.00735 | | | | | | |
| | TPU: | +/-0.00933 | | +/-0.00736 | | | | | | |
| **Plutonium-242 Tracer | 2.41 | 1.05 | | 1.11 | pCi/L | | 46.1 * | (50%-105%) | | |
| | Uncert: | +/-0.0776 | | +/-0.0773 | | | | | | |
| | TPU: | +/-0.129 | | +/-0.128 | | | | | | |
| QC1203116116 LCS | | | | | | | | | | |
| Plutonium-238 | | | U | 0.011 | pCi/L | | | (80%-120%) | JXR1 | 07/07/1414:33 |
| | Uncert: | | | +/-0.00584 | | | | | | |
| | TPU: | | | +/-0.00586 | | | | | | |
| Plutonium-239/240 | 1.97 | | | 1.78 | pCi/L | | 90.1 | (80%-120%) | | |
| | Uncert: | | | +/-0.0626 | | | | | | |
| | TPU: | | | +/-0.100 | | | | | | |
| **Plutonium-242 Tracer | 1.93 | | | 1.54 | pCi/L | | 79.8 | (50%-105%) | | |
| | Uncert: | | | +/-0.0655 | | | | | | |
| | TPU: | | | +/-0.107 | | | | | | |
| QC1203116114 MB | | | | | | | | | | |
| Plutonium-238 | | | U | -0.00648 | pCi/L | | | | JXR1 | 07/12/1410:51 |
| | Uncert: | | | +/-0.00604 | | | | | | |
| | TPU: | | | +/-0.00604 | | | | | | |
| Plutonium-239/240 | | | U | 0.008 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00716 | | | | | | |

## QC Summary

**Workorder: 350951**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1398721 | | | | | | | | | | |
| | TPU: | | | +/-0.00717 | | | | | | |
| **Plutonium-242 Tracer | 1.93 | | | 1.01 | pCi/L | | 52.6 | (50%-105%) | | |
| | Uncert: | | | +/-0.0664 | | | | | | |
| | TPU: | | | +/-0.108 | | | | | | |
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1397133 | | | | | | | | | | |
| QC1203112194 350951005 DUP | | | | | | | | | | |
| Cesium-137 | U | -1.07 | U | -1.03 | pCi/L | 0.00776 | | (0-1) | MJH1 | 06/30/1408:13 |
| | Uncert: | +/-1.27 | | +/-1.59 | | | | | | |
| | TPU: | +/-1.29 | | +/-1.61 | | | | | | |
| Cobalt-60 | U | 0.184 | U | -0.218 | pCi/L | 0.0764 | | (0-1) | | |
| | Uncert: | +/-1.38 | | +/-1.25 | | | | | | |
| | TPU: | +/-1.38 | | +/-1.25 | | | | | | |
| Neptunium-237 | U | 2.55 | U | 1.14 | pCi/L | 0.129 | | (0-1) | | |
| | Uncert: | +/-2.78 | | +/-2.63 | | | | | | |
| | TPU: | +/-2.84 | | +/-2.64 | | | | | | |
| Potassium-40 | U | -1.52 | U | -11 | pCi/L | 0.140 | | (0-1) | | |
| | Uncert: | +/-17.4 | | +/-16.3 | | | | | | |
| | TPU: | +/-17.4 | | +/-16.5 | | | | | | |
| Sodium-22 | U | -1.45 | U | 2.03 | pCi/L | 0.693 | | (0-1) | | |
| | Uncert: | +/-1.05 | | +/-1.33 | | | | | | |
| | TPU: | +/-1.10 | | +/-1.41 | | | | | | |
| QC1203112195 LCS | | | | | | | | | | |
| Americium-241 | 34500 | | | 37500 | pCi/L | | 109 | (80%-120%) | MJH1 | 06/27/1413:26 |
| | Uncert: | | | +/-779 | | | | | | |
| | TPU: | | | +/-1830 | | | | | | |
| Cesium-137 | 14100 | | | 14400 | pCi/L | | 103 | (80%-120%) | | |
| | Uncert: | | | +/-177 | | | | | | |
| | TPU: | | | +/-606 | | | | | | |
| Cobalt-60 | 17600 | | | 17700 | pCi/L | | 100 | (80%-120%) | | |
| | Uncert: | | | +/-212 | | | | | | |
| | TPU: | | | +/-759 | | | | | | |
| Neptunium-237 | | | U | 31.9 | pCi/L | | | | | |
| | Uncert: | | | +/-88.0 | | | | | | |
| | TPU: | | | +/-88.3 | | | | | | |
| Potassium-40 | | | U | -28.9 | pCi/L | | | | | |
| | Uncert: | | | +/-174 | | | | | | |
| | TPU: | | | +/-174 | | | | | | |
| Sodium-22 | | | U | 8.45 | pCi/L | | | | | |
| | Uncert: | | | +/-26.7 | | | | | | |
| | TPU: | | | +/-26.8 | | | | | | |
| QC1203112193 MB | | | | | | | | | | |
| Cesium-137 | | | U | 1.34 | pCi/L | | | | MJH1 | 06/27/1411:58 |
| | Uncert: | | | +/-2.14 | | | | | | |
| | TPU: | | | +/-2.14 | | | | | | |
| Cobalt-60 | | | U | -0.487 | pCi/L | | | | | |

## QC Summary

**Workorder: 350951**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1397133 | | | | | | | | | | |
| | Uncert: | | | +/-0.941 | | | | | | |
| | TPU: | | | +/-0.948 | | | | | | |
| Neptunium-237 | | | U | -5.55 | pCi/L | | | | | |
| | Uncert: | | | +/-2.53 | | | | | | |
| | TPU: | | | +/-2.85 | | | | | | |
| Potassium-40 | | | U | 38.8 | pCi/L | | | | | |
| | Uncert: | | | +/-14.7 | | | | | | |
| | TPU: | | | +/-14.8 | | | | | | |
| Sodium-22 | | | U | 0.214 | pCi/L | | | | | |
| | Uncert: | | | +/-1.35 | | | | | | |
| | TPU: | | | +/-1.35 | | | | | | |
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1399646 | | | | | | | | | | |
| QC1203118496 351467001 DUP | | | | | | | | | | |
| Strontium-90 | U | 0.0256 | U | -0.183 | pCi/L | 0.693 | | (0-1) | KSD1 | 07/08/1414:35 |
| | Uncert: | +/-0.0851 | | +/-0.0655 | | | | | | |
| | TPU: | +/-0.0851 | | +/-0.0655 | | | | | | |
| **Strontium Carrier | 8.20 | 7.60 | | 7.50 | mg | | 91.5 | (50%-105%) | | |
| QC1203118498 LCS | | | | | | | | | | |
| Strontium-90 | 22.6 | | | 22.1 | pCi/L | | 97.7 | (80%-120%) | KSD1 | 07/07/1410:47 |
| | Uncert: | | | +/-0.532 | | | | | | |
| | TPU: | | | +/-1.85 | | | | | | |
| **Strontium Carrier | 8.20 | | | 6.80 | mg | | 82.9 | (50%-105%) | | |
| QC1203118495 MB | | | | | | | | | | |
| Strontium-90 | | | U | 0.0264 | pCi/L | | | | KSD1 | 07/07/1410:47 |
| | Uncert: | | | +/-0.121 | | | | | | |
| | TPU: | | | +/-0.121 | | | | | | |
| **Strontium Carrier | 8.20 | | | 7.50 | mg | | 91.5 | (50%-105%) | | |
| QC1203118497 351467001 MS | | | | | | | | | | |
| Strontium-90 | 226 U | 0.0256 | | 222 | pCi/L | | 98.3 | (75%-125%) | KSD1 | 07/07/1410:48 |
| | Uncert: | +/-0.0851 | | +/-5.05 | | | | | | |
| | TPU: | +/-0.0851 | | +/-18.5 | | | | | | |
| **Strontium Carrier | 8.20 | 7.60 | | 7.50 | mg | | 91.5 | (50%-105%) | | |
| Batch 1399669 | | | | | | | | | | |
| QC1203118573 351467001 DUP | | | | | | | | | | |
| Alpha | U | -0.336 | U | -0.403 | pCi/L | 0.0554 | | (0-1) | JXH3 | 07/10/1417:07 |
| | Uncert: | +/-0.310 | | +/-0.293 | | | | | | |
| | TPU: | +/-0.310 | | +/-0.293 | | | | | | |
| Beta | | 3.30 | | 4.45 | pCi/L | 0.312 | | (0-1) | | 07/07/1412:37 |
| | Uncert: | +/-0.723 | | +/-0.988 | | | | | | |
| | TPU: | +/-0.774 | | +/-1.06 | | | | | | |
| QC1203118576 LCS | | | | | | | | | | |
| Alpha | 12.3 | | | 12.9 | pCi/L | | 104 | (80%-120%) | JXH3 | 07/10/1417:07 |
| | Uncert: | | | +/-0.643 | | | | | | |
| | TPU: | | | +/-1.31 | | | | | | |

## QC Summary

**Workorder:** **350951**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1399669 | | | | | | | | | | |
| Beta | 45.2 | | | 50.2 | pCi/L | | 111 | (80%-120%) | | |
| | Uncert: | | | +/-0.913 | | | | | | |
| | TPU: | | | +/-4.25 | | | | | | |
| QC1203118572 MB | | | | | | | | | | |
| Alpha | | | U | -0.0926 | pCi/L | | | | JXH3 | 07/10/1417:07 |
| | Uncert: | | | +/-0.0274 | | | | | | |
| | TPU: | | | +/-0.0274 | | | | | | |
| Beta | | | U | 0.398 | pCi/L | | | | | 07/08/1408:58 |
| | Uncert: | | | +/-0.180 | | | | | | |
| | TPU: | | | +/-0.183 | | | | | | |
| QC1203118574 351467001 MS | | | | | | | | | | |
| Alpha | 165 U | -0.336 | | 164 | pCi/L | | 99.8 | (75%-125%) | JXH3 | 07/10/1417:07 |
| | Uncert: | +/-0.310 | | +/-9.25 | | | | | | |
| | TPU: | +/-0.310 | | +/-17.2 | | | | | | |
| Beta | 602 | 3.30 | | 693 | pCi/L | | 115 | (75%-125%) | | 07/08/1408:58 |
| | Uncert: | +/-0.723 | | +/-12.6 | | | | | | |
| | TPU: | +/-0.774 | | +/-58.9 | | | | | | |
| QC1203118575 351467001 MSD | | | | | | | | | | |
| Alpha | 165 U | -0.336 | | 175 | pCi/L | 0.151 | 106 | (0-1) | JXH3 | 07/10/1417:07 |
| | Uncert: | +/-0.310 | | +/-9.30 | | | | | | |
| | TPU: | +/-0.310 | | +/-18.1 | | | | | | |
| Beta | 602 | 3.30 | | 670 | pCi/L | 0.100 | 111 | (0-1) | | 07/08/1408:58 |
| | Uncert: | +/-0.723 | | +/-12.4 | | | | | | |
| | TPU: | +/-0.774 | | +/-57.0 | | | | | | |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

| | |
|---|---|
| ** | Analyte is a Tracer compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| BD | Results are either below the MDC or tracer recovery is low |
| FA | Failed analysis. |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| K | Analyte present. Reported value may be biased high. Actual value is expected to be lower. |
| L | Analyte present. Reported value may be biased low. Actual value is expected to be higher. |
| M | M if above MDC and less than LLD |
| M | REMP Result > MDC/CL and < RDL |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |

## QC Summary

**Workorder:** **350951**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| UI | Gamma Spectroscopy--Uncertain identification |
| UJ | Gamma Spectroscopy--Uncertain identification |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | Other specific qualifiers were required to properly define the results. Consult case narrative. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
** Indicates analyte is a surrogate/tracer compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

**COC/Lab Request #:** 2014-3584



**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8081A-HCB | WSP-LL-8151A-PCP | WSP-LL-8260B | WSP-LL-8270C | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-79460 | Jun 18 2014 | 09:53 | W | 1 | 2 | 3 | 2 | 3 | 2 | 3 | | 1 | | 1 | 2 | 2 | 2 | 1 | | 1 | 1 | | |
| CALA-14-79466 | Jun 18 2014 | 09:53 | W | | | | | | | | 1 | | 1 | | | | | | 1 | | | | |
| CALA-14-79452 | Jun 18 2014 | 09:53 | W | | 2 | | 2 | | | | | | | | | | | | | | | | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 6/19/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79452

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 6/18/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 0953 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Vine Tree Spring | | FIELD PREP: | UF | OK |
| LOCATION TYPE: | | | FIELD QC TYPE: | FTB | |
| PORT: | | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 1 | HCL ~~Na2S2O3~~ MS 6/17/14 | Y | N/A |
| N/A | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 1 | HCL MS 6/17/14 | Y | N/A |
| | ~~WSP-LL-8260B~~ | ~~40 ML SEPTUM AMBER GLASS~~ MS 6/18/14 | ~~1~~ | ~~HCL~~ MS 6/17/14 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Shaw

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| W. Shaw | 6/18/2014 1215 | | 6/18/14 1215 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 05/30/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79460

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 6/18/2013 | **FIELD MATRIX:** | WG | OK |
| **TIME COLLECTED (HH:MM):** | | 0953 | **MEDIA:** | UA | ✓ |
| **PRS ID:** | | OK | **SAMPLE TECH CODE:** | UA | PP |
| **LOCATION ID:** | Vine Tree Spring | ✓ | **FIELD PREP:** | UF | OK |
| **LOCATION TYPE:** | SPR | ✓ | **FIELD QC TYPE:** | REG | ✓ |
| **PORT:** | | ✓ | **SAMPLE USAGE:** | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | X | N/A |
| ✓ | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ✓ | ✓ |
| ✓ | WSP-8082-PCB | 1 LITER AMBER GLASS | 3 | ICE | ✓ | ✓ |
| ✓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ✓ | ✓ |
| ✓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 3 | ICE | ✓ | ✓ |
| ✓ | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | ✓ | ✓ |
| ✓ | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS | 3 | ICE | ✓ | ✓ |
| ✓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ✓ | ✓ |
| ✓ | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | ✓ | ✓ |
| ✓ | WSP-LL-8081A-HCB | 1 LITER AMBER GLASS | 2 | ICE | ✓ | ✓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79460

**WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | Y | N/A |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen 7.55 mg/L Flow (in gpm) 7.6 GPM Oxidation-Reduction Potential NA mV

pH 7.96 SU Specific Conductance 295 uS/cm Temperature 14.26 deg C

Turbidity 2.6 NTU

**COLLECTED BY (PRINT)** W. Shaw

| | | | |
|---|---|---|---|
| **RELINQUISHED BY** (Printed Name) William Shaw (Signature) | Date/Time 6/18/2014 1215 | **RECEIVED BY** (Printed Name) (Signature) | Date/Time 6/18/14 1215 |
| **RELINQUISHED BY** (Printed Name) (Signature) | Date/Time | **RECEIVED BY** (Printed Name) (Signature) | Date/Time |

Report Date 05/30/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79466

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 6/18/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 0953 | MEDIA: | UA | ↓ |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Vine Tree Spring | ↓ | FIELD PREP: | F | OK |
| LOCATION TYPE: | SPR | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | N/A |
| ↓ | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

William Shaw 6/18/2014

**COLLECTED BY (PRINT)** W. Shaw

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) William Shaw<br>(Signature) | 6/18/2014 1215 | (Printed Name) M. Martin<br>(Signature) | 6/18/14 1215 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 05/30/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-3584

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 351059 | EPA:120.1 | 1 | | | | |
| 351059 | EPA:150.1 | 1 | | | | |
| 351059 | EPA:160.1 | 1 | | | | |
| 351059 | EPA:245.2 | 2 | | | | |
| 351059 | EPA:300.0 | 1 | | | | |
| 351059 | EPA:310.1 | 1 | | | | |
| 351059 | EPA:335.4 | 1 | | | | |
| 351059 | EPA:350.1 | 1 | | | | |
| 351059 | EPA:351.2 | 1 | | | | |
| 351059 | EPA:353.2 | 1 | | | | |
| 351059 | EPA:365.4 | 1 | | | | |
| 351059 | EPA:900 | 1 | | | | |
| 351059 | EPA:901.1 | 1 | | | | |
| 351059 | EPA:905.0 | 1 | | | | |
| 351059 | HASL-300:AM-241 | 1 | | | | |
| 351059 | HASL-300:ISOPU | 1 | | | | |
| 351059 | HASL-300:ISOU | 1 | | | | |
| 351059 | SM:A2340B | 1 | | | | |
| 351059 | SW-846:6010C | 1 | | | | |
| 351059 | SW-846:6020 | 1 | | | | |
| 351059 | SW-846:6850 | 1 | | | | |
| 351059 | SW-846:8011 | 1 | | | | |
| 351059 | SW-846:8081B | 1 | | | | |
| 351059 | SW-846:8082 | 1 | | | | |
| 351059 | SW-846:8151A | 1 | | | | |
| 351059 | SW-846:8260B | 1 | | 1 | | |
| 351059 | SW-846:8270D | 1 | | | | |
| 351059 | SW-846:8310 | 1 | | | | |
| 351059 | SW-846:8321A_MOD | 1 | | | | |
| 351059 | SW-846:9060 | 1 | | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 351059 | EPA:120.1 | 1400986 | 1400986 | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 351059 | EPA:150.1 | 1400108 | 1400108 | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 351059 | EPA:160.1 | 1398055 | 1398055 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | EPA:245.2 | 1398324 | 1398323 | 2 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 351059 | EPA:300.0 | 1398075 | 1398075 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 351059 | EPA:310.1 | 1400107 | 1400107 | 1 | | | | | 2 | | | | | 2 | | | | 1 | | | |
| 351059 | EPA:335.4 | 1397084 | 1397082 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | EPA:350.1 | 1397518 | 1397517 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 351059 | EPA:351.2 | 1397514 | 1397513 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 351059 | EPA:353.2 | 1397522 | 1397522 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 351059 | EPA:365.4 | 1397516 | 1397515 | 1 | | | | | 1 | | | | | 1 | | | | 3 | | | |
| 351059 | EPA:900 | 1399669 | 1399669 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | EPA:901.1 | 1398331 | 1398331 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | EPA:905.0 | 1399646 | 1399646 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | HASL-300:AM-241 | 1398720 | 1398720 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | HASL-300:ISOPU | 1398721 | 1398721 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | HASL-300:ISOU | 1397164 | 1397164 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | SM:A2340B | 1404141 | 1404141 | 1 | | | | | | | | | | | | | | | | | |
| 351059 | SW-846:6010C | 1397744 | 1397743 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | SW-846:6020 | 1397720 | 1397719 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 351059 | SW-846:6850 | 1397916 | 1397915 | 1 | | | | | 1 | | | | | 1 | | | | | | | |
| 351059 | SW-846:8011 | 1400058 | 1400057 | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |
| 351059 | SW-846:8081B | 1398217 | 1398216 | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |
| 351059 | SW-846:8082 | 1398308 | 1398306 | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |
| 351059 | SW-846:8151A | 1397789 | 1397787 | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |
| 351059 | SW-846:8260B | 1399998 | 1399998 | 1 | | 1 | | | 1 | | | | | 2 | | | | | | | |
| 351059 | SW-846:8270D | 1398264 | 1398263 | 1 | | | | | 1 | | | | | 1 | | | | | | | |
| 351059 | SW-846:8310 | 1398214 | 1398212 | 1 | | | | | 1 | | | | | 1 | | | | | | | |
| 351059 | SW-846:8321A_MOD | 1398124 | 1398120 | 1 | | | | | 1 | | | | | 1 | | | | | | | |
| 351059 | SW-846:9060 | 1397532 | 1397532 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |

# DATA VALIDATION REPORT

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CALA-14-79466 | 1203121764 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203121763 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CALA-14-79464 | 1203119756 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203119758 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CALA-14-79464 | 1203114532 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203114536 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203114531 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-79460 | 1203115080 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-79460 | 351059005 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203115079 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203115078 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | WTRON-14-79963 | 1203115083 | DUP | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CALA-14-79466 | 1203114581 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CALA-14-79466 | 351059008 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203114585 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203114580 | MB | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | WT_REF-13-81148 | 1203114582 | DUP | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CALA-14-79466 | 1203119748 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CALA-14-79466 | 351059008 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203119753 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203119754 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203119743 | MB | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203119744 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CALA-14-79458 | 1203113067 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CALA-14-79460 | 351059005 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203112039 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203112036 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CALA-14-79464 | 1203113116 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203113123 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203113114 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | WST03-14-67206 | 1203113115 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CALA-14-79458 | 1203113094 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CALA-14-79460 | 351059005 | REG | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203113101 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203113090 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | VS-R28-V2-79984 | 1203113091 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CALA-14-79464 | 1203113137 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203113141 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203113134 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | WST03-14-67206 | 1203113135 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CALA-14-79464 | 1203113106 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203113113 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203113102 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | VS-R28-V2-79984 | 1203113103 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | WST03-14-67206 | 1203113104 | DUP | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | CALA-14-79460 | 351059005 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CALA-14-79747 | 1203118573 | DUP | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | LCS | 1203118576 | LCS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | MB | 1203118572 | MB | 2 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CALA-14-79460 | 1203115103 | DUP | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CALA-14-79460 | 351059005 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | LCS | 1203115104 | LCS | 0 | 0 | 3 | 0 |
| EPA:901.1 | RAD | MB | 1203115102 | MB | 5 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CALA-14-79460 | 351059005 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CALA-14-79747 | 1203118496 | DUP | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | LCS | 1203118498 | LCS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | MB | 1203118495 | MB | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CALA-14-79460 | 1203116112 | DUP | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CALA-14-79460 | 351059005 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | LCS | 1203116113 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:AM-241 | RAD | MB | 1203116111 | MB | 1 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CALA-14-79460 | 1203116115 | DUP | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CALA-14-79460 | 351059005 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | LCS | 1203116116 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOPU | RAD | MB | 1203116114 | MB | 2 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CALA-14-79458 | 1203112269 | DUP | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CALA-14-79460 | 351059005 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | LCS | 1203112270 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOU | RAD | MB | 1203112268 | MB | 3 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CALA-14-79466 | 1203113668 | DUP | 17 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:6010C | INORGANIC | CALA-14-79466 | 351059008 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203113667 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203113666 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CALA-14-79466 | 1203113622 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CALA-14-79466 | 351059008 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203113621 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203113620 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CALA-14-79466 | 351059008 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203114150 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203114149 | MB | 1 | 0 | 0 | 0 |
| SW-846:8011 | VOC | CALA-14-79460 | 351059001 | REG | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | LCS | 1203119632 | LCS | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | LCSD | 1203119633 | LCSD | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | MB | 1203119631 | MB | 2 | 1 | 0 | 0 |
| SW-846:8081B | PESTPCB | CALA-14-79460 | 351059006 | REG | 1 | 2 | 0 | 0 |
| SW-846:8081B | PESTPCB | LCS | 1203114815 | LCS | 0 | 2 | 1 | 0 |
| SW-846:8081B | PESTPCB | LCSD | 1203114818 | LCSD | 0 | 2 | 1 | 0 |
| SW-846:8081B | PESTPCB | MB | 1203114814 | MB | 1 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CALA-14-79460 | 351059002 | REG | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | LCS | 1203115034 | LCS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | LCSD | 1203115041 | LCSD | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | MB | 1203115033 | MB | 8 | 2 | 0 | 0 |
| SW-846:8151A | HERB | CALA-14-79460 | 351059007 | REG | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | LCS | 1203113794 | LCS | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | LCSD | 1203113795 | LCSD | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | MB | 1203113792 | MB | 1 | 1 | 0 | 0 |
| SW-846:8260B | VOC | CALA-14-79452 | 351059010 | FTB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CALA-14-79460 | 351059005 | REG | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | LCS | 1203119466 | LCS | 0 | 3 | 68 | 0 |
| SW-846:8260B | VOC | LCS | 1203119467 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203119463 | MB | 78 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | CALA-14-79460 | 351059005 | REG | 60 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | LCS | 1203114924 | LCS | 0 | 6 | 56 | 0 |
| SW-846:8270D | SVOC | MB | 1203114923 | MB | 60 | 6 | 0 | 0 |
| SW-846:8310 | SVOC | CALA-14-79460 | 351059003 | REG | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | LCS | 1203114811 | LCS | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | MB | 1203114810 | MB | 18 | 1 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | CALA-14-79460 | 351059004 | REG | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | LCS | 1203114639 | LCS | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | MB | 1203114638 | MB | 20 | 2 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:9060 | GENERAL CHEMISTRY | CALA-14-79458 | 1203113155 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CALA-14-79460 | 351059005 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203113159 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203113154 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203113090 | METHOD BLANK | EPA:351.2 | W | Total Kjeldahl Nitrogen | 0.0414 | J | mg/L | 0.100 |
| MB | 1203113134 | METHOD BLANK | EPA:353.2 | W | Nitrate-Nitrite as Nitrogen | 0.0281 | J | mg/L | 0.050 |
| MB | 1203113666 | METHOD BLANK | SW-846:6010C | W | Sodium | 127 | J | ug/L | 300 |

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-79460 | 1203113090 | METHOD BLANK | EPA:351.2 | Total Kjeldahl Nitrogen | 0.0414 | mg/L | 0.110 | | 0.100 | Y | 5 | 100 | Y |
| CALA-14-79466 | 1203113134 | METHOD BLANK | EPA:353.2 | Nitrate-Nitrite as Nitrogen | 0.0281 | mg/L | 3.44 | | 0.500 | Y | 5 | 100 | Y |

# DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203119466 | | SW-846:8260B | Methylene Chloride | 1399998 | 07-01-2014 | W | 67 | | 120 | 75 | | 10 | | |
| 1203119467 | | SW-846:8260B | Chloro-1-propene[3-] | 1399998 | 07-01-2014 | W | 65 | | 127 | 67 | | 10 | | |
| 1203114924 | | SW-846:8270D | Nitrophenol[4-] | 1398263 | 06-25-2014 | W | 15 | | 77 | 16 | | | | |
| 1203114924 | | SW-846:8270D | Tetrachlorobenzene[1,2,4,5] | 1398263 | 06-25-2014 | W | 34 | | 95 | 36 | | | | |
| 1203114639 | | SW-846:8321A_MOD | Tetryl | 1398120 | 07-15-2014 | W | 44 | | 120 | 65 | | 10 | | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

# DATA VALIDATION REPORT

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | 2014-3584 | CALA-14-79452 | FTB | INIT | VOC | SW-846:8260B | Chloro-1-propene[3-] | U | UJ | V12a | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 06/18/2014 | | 1399998 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79452 | FTB | INIT | VOC | SW-846:8260B | Methylene Chloride | U | UJ | V12a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 06/18/2014 | | 1399998 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | .00199 | pCi/L | .00199 | pCi/L | 0.0368 | 0.00596 | W | 06/18/2014 | | 1398720 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | -1.61 | pCi/L | -1.61 | pCi/L | 5.37 | 1.49 | W | 06/18/2014 | | 1398331 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | VOC | SW-846:8260B | Chloro-1-propene[3-] | U | UJ | V12a | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 06/18/2014 | | 1399998 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | -.482 | pCi/L | -.482 | pCi/L | 4.79 | 1.30 | W | 06/18/2014 | | 1398331 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | .905 | pCi/L | .905 | pCi/L | 1.45 | 0.447 | W | 06/18/2014 | | 1399669 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | VOC | SW-846:8260B | Methylene Chloride | U | UJ | V12a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 06/18/2014 | | 1399998 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | .231 | pCi/L | .231 | pCi/L | 9.59 | 2.73 | W | 06/18/2014 | | 1398331 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | SVOC | SW-846:8270D | Nitrophenol[4-] | U | UJ | SV12a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 06/18/2014 | | 1398264 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | .00247 | pCi/L | .00247 | pCi/L | 0.0275 | 0.00499 | W | 06/18/2014 | | 1398721 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | .0102 | pCi/L | .0102 | pCi/L | 0.053 | 0.00932 | W | 06/18/2014 | | 1398721 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | 11.6 | pCi/L | 11.6 | pCi/L | 63.1 | 16.4 | W | 06/18/2014 | | 1398331 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | .0431 | pCi/L | .0431 | pCi/L | 4.25 | 1.08 | W | 06/18/2014 | | 1398331 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | .0468 | pCi/L | .0468 | pCi/L | 0.357 | 0.0967 | W | 06/18/2014 | | 1399646 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | SVOC | SW-846:8270D | Tetrachlorobenzene[1,2,4,5] | U | UJ | SV12a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 06/18/2014 | | 1398264 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Tetryl | U | UJ | HE12a | N | 0.538 | ug/L | 0.538 | ug/L | | | W | 06/18/2014 | | 1398124 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | | U | I4 | N | 0.110 | mg/L | 0.110 | mg/L | | | W | 06/18/2014 | | 1397514 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79460 | REG | INIT | RAD | HASL-300:ISOU | Uranium-235/236 | U | U | R5 | N | .047 | pCi/L | .047 | pCi/L | 0.055 | 0.0129 | W | 06/18/2014 | | 1397164 | VAL | Y |
| Vine Tree Spring | 2014-3584 | CALA-14-79466 | REG | INIT | GENERAL CHEMISTRY | EPA:353.2 | Nitrate-Nitrite as Nitrogen | | J | I4a | Y | 3.44 | mg/L | 3.44 | mg/L | | | W | 06/18/2014 | | 1397522 | VAL | Y |

| Reason Code | Description |
|---|---|
| HE12a | The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits. |
| I4 | the sample result is =<5x the concentration of related analyte in the method blank. |
| I4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x |

# DATA VALIDATION REPORT

| Reason Code | Description |
|---|---|
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| R5 | Analyte is not detected because the amount reported is less than the MDC. |
| SV12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |
| V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CALA-14-79452 | Vine Tree Spring | FTB | SW-846:8260B | 0 | 78 |
| CALA-14-79460 | Vine Tree Spring | REG | EPA:245.2 | 0 | 1 |
| CALA-14-79460 | Vine Tree Spring | REG | EPA:335.4 | 0 | 1 |
| CALA-14-79460 | Vine Tree Spring | REG | EPA:351.2 | 0 | 1 |
| CALA-14-79460 | Vine Tree Spring | REG | EPA:900 | 0 | 2 |
| CALA-14-79460 | Vine Tree Spring | REG | EPA:901.1 | 0 | 5 |
| CALA-14-79460 | Vine Tree Spring | REG | EPA:905.0 | 0 | 1 |
| CALA-14-79460 | Vine Tree Spring | REG | HASL-300:AM-241 | 0 | 1 |
| CALA-14-79460 | Vine Tree Spring | REG | HASL-300:ISOPU | 0 | 2 |
| CALA-14-79460 | Vine Tree Spring | REG | HASL-300:ISOU | 0 | 3 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:8011 | 0 | 2 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:8081B | 0 | 1 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:8082 | 0 | 8 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:8151A | 0 | 1 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:8260B | 0 | 78 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:8270D | 0 | 60 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:8310 | 0 | 18 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:8321A_MOD | 0 | 20 |
| CALA-14-79460 | Vine Tree Spring | REG | SW-846:9060 | 0 | 1 |
| CALA-14-79466 | Vine Tree Spring | REG | EPA:120.1 | 0 | 1 |
| CALA-14-79466 | Vine Tree Spring | REG | EPA:150.1 | 0 | 1 |
| CALA-14-79466 | Vine Tree Spring | REG | EPA:160.1 | 0 | 1 |
| CALA-14-79466 | Vine Tree Spring | REG | EPA:245.2 | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CALA-14-79466 | Vine Tree Spring | REG | EPA:300.0 | 0 | 4 |
| CALA-14-79466 | Vine Tree Spring | REG | EPA:310.1 | 0 | 2 |
| CALA-14-79466 | Vine Tree Spring | REG | EPA:350.1 | 0 | 1 |
| CALA-14-79466 | Vine Tree Spring | REG | EPA:353.2 | 0 | 1 |
| CALA-14-79466 | Vine Tree Spring | REG | EPA:365.4 | 0 | 1 |
| CALA-14-79466 | Vine Tree Spring | REG | SM:A2340B | 0 | 1 |
| CALA-14-79466 | Vine Tree Spring | REG | SW-846:6010C | 0 | 17 |
| CALA-14-79466 | Vine Tree Spring | REG | SW-846:6020 | 0 | 11 |
| CALA-14-79466 | Vine Tree Spring | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
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July 15, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Groundwater Samples
Work Order: 351059
SDG: 2014-3584

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 20, 2014, and analyzed for Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2014-3584
Enclosures

**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Work Order #: 351059**
**SDG: 2014-3584**

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# Case Narrative

**Case Narrative for**
**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Workorder #: 351059**
**SDG # : 2014-3584**

**July 15, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 20, 2014 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 351059001 | CALA-14-79460 |
| 351059002 | CALA-14-79460 |
| 351059003 | CALA-14-79460 |
| 351059004 | CALA-14-79460 |
| 351059005 | CALA-14-79460 |
| 351059006 | CALA-14-79460 |
| 351059007 | CALA-14-79460 |
| 351059008 | CALA-14-79466 |
| 351059010 | CALA-14-79452 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 15 July 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−14−9 |
| Utah NELAP | SC000122014−13 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

351059

ADEP

**COC/Lab Request #:** 2014-3584

Page 1 of 1

**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8081A-HCB | WSP-LL-8151A-PCP | WSP-LL-8260B | WSP-LL-8270C | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALA-14-79460 | Jun 18 2014 | 09:53 | W | 1 | 2 | 3 | 2 | 3 | 2 | 3 | | 1 | | 1 | 2 | 2 | 2 | 1 | | 1 | 1 | | |
| CALA-14-79466 | Jun 18 2014 | 09:53 | W | | | | | | | | 1 | | 1 | | | | | | 1 | | | | |
| CALA-14-79452 | Jun 18 2014 | 09:53 | W | | 2 | | 2 | | | | | | | | | | | | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | Melissa Martz | 6/9/14 3:00 | P. Nlent | Patricia Dent | 6/20/14 0900 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| **Client:** LANL | **SDG/AR/COC/Work Order:** 2014-3584 |
| **Received By:** P. Quint | **Date Received:** 6/20/14 |

| **Suspected Hazard Information** | **Yes** | **No** | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | X | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0CPM |
| Classified Radioactive II or III by RSO? | | X | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | X | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | X | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | X | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | X | |

| | **Sample Receipt Criteria** | **Yes** | **NA** | **No** | **Comments/Qualifiers (Required for Non-Conforming Items)** |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | X | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) 2.5c *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | X | | | Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966 |
| 3 | Chain of custody documents included with shipment? | X | | | |
| 4 | Sample containers intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | X | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | X | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | X | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | X | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | X | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | X | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | | | X | Sample ID's affected: SEE below |
| 12 | Are sample containers identifiable as GEL provided? | | | X | |
| 13 | COC form is properly signed in relinquished/received sections? | X | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other<br>5908 1777 1939-2<br>5908 1777 1940<br>5908 1777 1928 } 5C |

Comments (Use Continuation Form if needed): CALA-14-79460 Lab rec'd (1) 8011-EDB + (1) 8260b Container each chain indicates (2) each.
CALA-14-79450 Lab rec'd (1) 8260b + (0) 8011-EDB Containers.

PM (or PMA) review: Initials HA Date 06/2014 Page 1 of 1

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 19JUN14
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2804

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

5c

521C5/9BC4/6F03

FedEx Express

J1412140522012 6

3 of 3
MPS# 0263 5908 1777 1940
Mstr# 5908 1777 1928 0201

FRI - 20 JUN 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11 8

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 19JUN14
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BILL SENDER

TO VALERIE DAVIS
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REF: WE991158W100

5c

521C5/9BC4/6F03

FedEx Express

J1412140522012 6

1 of 3
TRK# 0201 5908 1777 1928
## MASTER ##

FRI - 20 JUN 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11 8

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 19JUN14
ACTWGT: 30.0 LB MAN
CAD: 0014176/CAFE2804

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

2C

521C5/9BC4/6F03

FedEx Express

J141214052201 26

2 of 3

MPS# 0263 5908 1777 1939

Mstr# 5908 1777 1928

0201

FRI - 20 JUN 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# Case Narrative

**ChemStation Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer** |
| Analytical Method: | SW846 8260B DOE-AL |
| Analytical Batch Number: | 1399998 |

## Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 351059010 | CALA-14-79452 |
| 1203119463 | Method Blank (MB) |
| 1203119464 | 350951005(CALA-14-79458) Post Spike (PS) |
| 1203119465 | 350951005(CALA-14-79458) Post Spike Duplicate (PSD) |
| 1203119466 | Laboratory Control Sample (LCS) |
| 1203119467 | Laboratory Control Sample (LCS) |
| 1203119472 | 350951005(CALA-14-79458) Post Spike (PS) |
| 1203119473 | 350951005(CALA-14-79458) Post Spike Duplicate (PSD) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a ’d’ qualifier.

## Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Blank (MB) Statement**
The blank analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

**Laboratory Control Sample (LCS) Recovery**
The LCS 1203119466 (LCS) and 1203119467 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. See the Data Exception Report in the miscellaneous section of the data package.

**QC Sample Designation**
Sample 350951005 (CALA-14-79458) was designated for spike analysis.

**Matrix Spike (PS) Recovery Statement**
The spike 1203119464 (CALA-14-79458) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

**Matrix Spike Duplicate (PSD) Recovery Statement**
The spike duplicate 1203119465 (CALA-14-79458) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

**Relative Percent Difference (RPD) Statement**
The RPDs between the matrix spike pair met the acceptance limits.

**Internal Standard (ISTD) Acceptance**
The internal standard responses in all client and quality control samples met the required acceptance criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Sample Preservation and Integrity**
All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-analyses were not required for samples in this SDG.

**Miscellaneous Information**

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1313715.

**Manual Integrations**
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

**TIC Comment**
Tentatively identified compounds (TIC) were requested for this sample delivery group/work order. Please note that non-requested target analytes that are reported on the quantitation reports will be present on the Form I. These detected analytes are included in the calibrated method and as a result will be reported on the Sample Data Summary (Form I) or Certificate of Analysis (C of A). TIC data are included on the Sample Data Summary (Form I).

**Additional Comments**
Additional comments were not required for this SDG.

**Residual Chlorine**
Residual Chlorine was not detected in any of the samples in this SDG.

**System Configuration**

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|---|---|---|---|---|---|
| VOA6.I | Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler | HP6890N/HP5975 | DB-624 | J&W, 60m x 0.25mm x 1.4um | Trap 10 |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert  **Name: Erin Haubert**

**Date: 17 JUL 2014**  **Title: Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059005** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 16:08** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 16:08** | | | | |
| **Data File:** | **070114V6\6P213.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059005** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 16:08** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 16:08** | | | | |
| **Data File:** | **070114V6\6P213.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059005** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 16:08** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 16:08** | | | | |
| **Data File:** | **070114V6\6P213.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 45.8 | 50.0 | ug/L | 91.6 | (78%-124%) |
| Bromofluorobenzene | 47.6 | 50.0 | ug/L | 95.1 | (80%-120%) |
| Toluene-d8 | 47.6 | 50.0 | ug/L | 95.2 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 3.768 | 28.5 | ug/L | 0 | J |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059010** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79452** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 16:37** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 16:37** | | | | |
| **Data File:** | **070114V6\6P214.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059010** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79452** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 16:37** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 16:37** | | | | |
| **Data File:** | **070114V6\6P214.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059010** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79452** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 16:37** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 16:37** | | | | |
| **Data File:** | **070114V6\6P214.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 46.5 | 50.0 | ug/L | 93.0 | (78%-124%) |
| Bromofluorobenzene | 48.2 | 50.0 | ug/L | 96.3 | (80%-120%) |
| Toluene-d8 | 47.9 | 50.0 | ug/L | 95.9 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 3.768 | 5.87 | ug/L | 0 | J |

# Quality Control Summary

**Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-3584**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|---|---|---|---|---|
| 1203119466 | LCS for batch 1399998 | 86 | 93 | 91 |
| 1203119467 | LCS for batch 1399998 | 88 | 94 | 94 |
| 1203119463 | MB for batch 1399998 | 86 | 94 | 94 |
| 351059005 | CALA-14-79460 | 92 | 95 | 95 |
| 351059010 | CALA-14-79452 | 93 | 96 | 96 |
| 1203119464 | CALA-14-79458PS | 88 | 94 | 92 |
| 1203119465 | CALA-14-79458PSD | 88 | 95 | 93 |
| 1203119472 | CALA-14-79458PS | 90 | 95 | 95 |
| 1203119473 | CALA-14-79458PSD | 93 | 99 | 99 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| DCED4 | = 1,2-Dichloroethane-d4 | (78%-124%) |
| TOL | = Toluene-d8 | (80%-120%) |
| BFB | = Bromofluorobenzene | (80%-120%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119464**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:05**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PS | m,p-Xylenes | 100 | 0.00 | U | 103 | 103 | 72-120 |
| 75-05-8 | PS | Acetonitrile | 1250 | 0.00 | U | 959 | 77 | 61-135 |
| 67-64-1 | PS | Acetone | 250 | 0.00 | U | 70.1 | 28 * | 29-144 |
| 74-88-4 | PS | Iodomethane | 250 | 0.00 | U | 278 | 111 | 73-120 |
| 75-15-0 | PS | Carbon disulfide | 250 | 0.00 | U | 269 | 107 | 79-138 |
| 108-05-4 | PS | Vinyl acetate | 250 | 0.00 | U | 291 | 116 | 60-136 |
| 78-93-3 | PS | 2-Butanone | 250 | 0.00 | U | 94.6 | 38 | 38-136 |
| 108-10-1 | PS | 4-Methyl-2-pentanone | 250 | 0.00 | U | 192 | 77 | 70-132 |
| 591-78-6 | PS | 2-Hexanone | 250 | 0.00 | U | 116 | 46 * | 48-137 |
| 75-71-8 | PS | Dichlorodifluoromethane | 50.0 | 0.00 | U | 43.3 | 87 | 51-133 |
| 74-87-3 | PS | Chloromethane | 50.0 | 0.00 | U | 39.8 | 80 | 54-135 |
| 75-01-4 | PS | Vinyl chloride | 50.0 | 0.00 | U | 49.0 | 98 | 52-129 |
| 74-83-9 | PS | Bromomethane | 50.0 | 0.00 | U | 54.3 | 109 | 67-128 |
| 75-00-3 | PS | Chloroethane | 50.0 | 0.00 | U | 50.6 | 101 | 69-120 |
| 75-69-4 | PS | Trichlorofluoromethane | 50.0 | 0.00 | U | 56.7 | 113 | 66-126 |
| 60-29-7 | PS | Ethyl ether | 50.0 | 0.00 | U | 45.6 | 91 | 69-120 |
| 75-35-4 | PS | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 48.1 | 96 | 74-130 |
| 75-09-2 | PS | Methylene chloride | 50.0 | 1.28 | U | 36.6 | 71 * | 73-120 |
| 1634-04-4 | PS | tert-Butyl methyl ether | 50.0 | 0.00 | U | 49.4 | 99 | 71-124 |
| 156-60-5 | PS | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 47.9 | 96 | 75-124 |
| 75-34-3 | PS | 1,1-Dichloroethane | 50.0 | 0.00 | U | 48.5 | 97 | 76-122 |
| 156-59-2 | PS | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 47.6 | 95 | 77-121 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119464**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:05**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PS | 2,2-Dichloropropane | 50.0 | 0.00 | U | 53.3 | 107 | 72-129 |
| 74-97-5 | PS | Bromochloromethane | 50.0 | 0.00 | U | 54.7 | 109 | 78-122 |
| 67-66-3 | PS | Chloroform | 50.0 | 0.00 | U | 50.5 | 101 | 75-123 |
| 71-55-6 | PS | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 53.3 | 107 | 76-129 |
| 563-58-6 | PS | 1,1-Dichloropropene | 50.0 | 0.00 | U | 50.5 | 101 | 76-125 |
| 56-23-5 | PS | Carbon tetrachloride | 50.0 | 0.00 | U | 55.8 | 112 | 76-132 |
| 107-06-2 | PS | 1,2-Dichloroethane | 50.0 | 0.00 | U | 46.8 | 94 | 68-128 |
| 71-43-2 | PS | Benzene | 50.0 | 0.00 | U | 50.5 | 101 | 75-120 |
| 79-01-6 | PS | Trichloroethylene | 50.0 | 0.00 | U | 53.3 | 107 | 75-125 |
| 78-87-5 | PS | 1,2-Dichloropropane | 50.0 | 0.00 | U | 47.7 | 95 | 75-120 |
| 74-95-3 | PS | Dibromomethane | 50.0 | 0.00 | U | 51.0 | 102 | 77-122 |
| 75-27-4 | PS | Bromodichloromethane | 50.0 | 0.00 | U | 51.1 | 102 | 76-129 |
| 10061-01-5 | PS | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 51.6 | 103 | 75-127 |
| 108-88-3 | PS | Toluene | 50.0 | 0.00 | U | 49.2 | 98 | 72-120 |
| 10061-02-6 | PS | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 49.4 | 99 | 73-123 |
| 79-00-5 | PS | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 47.6 | 95 | 77-120 |
| 142-28-9 | PS | 1,3-Dichloropropane | 50.0 | 0.00 | U | 47.4 | 95 | 73-120 |
| 127-18-4 | PS | Tetrachloroethylene | 50.0 | 0.00 | U | 55.4 | 111 | 67-124 |
| 124-48-1 | PS | Dibromochloromethane | 50.0 | 0.00 | U | 54.5 | 109 | 70-130 |
| 108-90-7 | PS | Chlorobenzene | 50.0 | 0.00 | U | 51.1 | 102 | 74-120 |
| 100-41-4 | PS | Ethylbenzene | 50.0 | 0.00 | U | 49.7 | 99 | 72-120 |
| 95-47-6 | PS | o-Xylene | 50.0 | 0.00 | U | 50.1 | 100 | 72-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119464**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:05**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 100-42-5 | PS | Styrene | 50.0 | 0.00 | U | 50.5 | 101 | 74-124 |
| 75-25-2 | PS | Bromoform | 50.0 | 0.00 | U | 51.9 | 104 | 61-135 |
| 98-82-8 | PS | Isopropylbenzene | 50.0 | 0.00 | U | 49.8 | 100 | 71-124 |
| 79-34-5 | PS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 47.8 | 96 | 74-124 |
| 96-18-4 | PS | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 47.4 | 95 | 71-125 |
| 108-86-1 | PS | Bromobenzene | 50.0 | 0.00 | U | 50.3 | 101 | 72-120 |
| 103-65-1 | PS | n-Propylbenzene | 50.0 | 0.00 | U | 47.3 | 95 | 69-121 |
| 108-67-8 | PS | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 50.0 | 100 | 71-123 |
| 95-49-8 | PS | 2-Chlorotoluene | 50.0 | 0.00 | U | 50.6 | 101 | 71-120 |
| 106-43-4 | PS | 4-Chlorotoluene | 50.0 | 0.00 | U | 47.9 | 96 | 70-120 |
| 98-06-6 | PS | tert-Butylbenzene | 50.0 | 0.00 | U | 52.9 | 106 | 72-124 |
| 95-63-6 | PS | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 48.1 | 96 | 71-122 |
| 135-98-8 | PS | sec-Butylbenzene | 50.0 | 0.00 | U | 51.5 | 103 | 71-124 |
| 99-87-6 | PS | 4-Isopropyltoluene | 50.0 | 0.00 | U | 52.0 | 104 | 70-124 |
| 541-73-1 | PS | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 51.6 | 103 | 70-120 |
| 106-46-7 | PS | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 49.7 | 99 | 70-120 |
| 104-51-8 | PS | n-Butylbenzene | 50.0 | 0.00 | U | 50.5 | 101 | 69-125 |
| 87-68-3 | PS | Hexachlorobutadiene | 50.0 | 0.00 | U | 60.8 | 122 | 60-129 |
| 91-20-3 | PS | Naphthalene | 50.0 | 0.00 | U | 55.8 | 112 | 58-134 |
| 87-61-6 | PS | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 60.9 | 122 | 52-132 |
| 120-82-1 | PS | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 57.7 | 115 | 59-126 |
| 630-20-6 | PS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 54.2 | 108 | 78-128 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119464**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:05**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 95-50-1 | PS | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 51.5 | 103 | 72-120 |
| 71-36-3 | PS | n-Butyl alcohol | 5000 | 0.00 | U | 4680 | 94 | 64-138 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119465**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:34**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PSD | m,p-Xylenes | 100 | 0.00 | U | 105 | 105 | 72-120 | 2 | 0-20 |
| 75-05-8 | PSD | Acetonitrile | 1250 | 0.00 | U | 944 | 76 | 61-135 | 2 | 0-20 |
| 67-64-1 | PSD | Acetone | 250 | 0.00 | U | 68.4 | 27 * | 29-144 | 2 | 0-20 |
| 74-88-4 | PSD | Iodomethane | 250 | 0.00 | U | 281 | 112 | 73-120 | 1 | 0-20 |
| 75-15-0 | PSD | Carbon disulfide | 250 | 0.00 | U | 273 | 109 | 79-138 | 1 | 0-20 |
| 108-05-4 | PSD | Vinyl acetate | 250 | 0.00 | U | 287 | 115 | 60-136 | 1 | 0-20 |
| 78-93-3 | PSD | 2-Butanone | 250 | 0.00 | U | 92.4 | 37 * | 38-136 | 2 | 0-20 |
| 108-10-1 | PSD | 4-Methyl-2-pentanone | 250 | 0.00 | U | 188 | 75 | 70-132 | 2 | 0-20 |
| 591-78-6 | PSD | 2-Hexanone | 250 | 0.00 | U | 114 | 46 * | 48-137 | 2 | 0-20 |
| 75-71-8 | PSD | Dichlorodifluoromethane | 50.0 | 0.00 | U | 43.4 | 87 | 51-133 | 0 | 0-20 |
| 74-87-3 | PSD | Chloromethane | 50.0 | 0.00 | U | 39.3 | 79 | 54-135 | 1 | 0-20 |
| 75-01-4 | PSD | Vinyl chloride | 50.0 | 0.00 | U | 48.8 | 98 | 52-129 | 0 | 0-20 |
| 74-83-9 | PSD | Bromomethane | 50.0 | 0.00 | U | 54.6 | 109 | 67-128 | 1 | 0-20 |
| 75-00-3 | PSD | Chloroethane | 50.0 | 0.00 | U | 51.2 | 102 | 69-120 | 1 | 0-20 |
| 75-69-4 | PSD | Trichlorofluoromethane | 50.0 | 0.00 | U | 57.5 | 115 | 66-126 | 1 | 0-20 |
| 60-29-7 | PSD | Ethyl ether | 50.0 | 0.00 | U | 45.6 | 91 | 69-120 | 0 | 0-20 |
| 75-35-4 | PSD | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 48.7 | 97 | 74-130 | 1 | 0-20 |
| 75-09-2 | PSD | Methylene chloride | 50.0 | 1.28 | U | 37.3 | 72 * | 73-120 | 2 | 0-20 |
| 1634-04-4 | PSD | tert-Butyl methyl ether | 50.0 | 0.00 | U | 49.3 | 99 | 71-124 | 0 | 0-20 |
| 156-60-5 | PSD | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 48.7 | 97 | 75-124 | 2 | 0-20 |
| 75-34-3 | PSD | 1,1-Dichloroethane | 50.0 | 0.00 | U | 49.2 | 98 | 76-122 | 1 | 0-20 |
| 156-59-2 | PSD | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 47.8 | 96 | 77-121 | 0 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119465**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:34**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PSD | 2,2-Dichloropropane | 50.0 | 0.00 | U | 54.2 | 108 | 72-129 | 2 | 0-20 |
| 74-97-5 | PSD | Bromochloromethane | 50.0 | 0.00 | U | 54.9 | 110 | 78-122 | 0 | 0-20 |
| 67-66-3 | PSD | Chloroform | 50.0 | 0.00 | U | 51.1 | 102 | 75-123 | 1 | 0-20 |
| 71-55-6 | PSD | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 54.7 | 109 | 76-129 | 3 | 0-20 |
| 563-58-6 | PSD | 1,1-Dichloropropene | 50.0 | 0.00 | U | 52.0 | 104 | 76-125 | 3 | 0-20 |
| 56-23-5 | PSD | Carbon tetrachloride | 50.0 | 0.00 | U | 57.4 | 115 | 76-132 | 3 | 0-20 |
| 107-06-2 | PSD | 1,2-Dichloroethane | 50.0 | 0.00 | U | 46.9 | 94 | 68-128 | 0 | 0-20 |
| 71-43-2 | PSD | Benzene | 50.0 | 0.00 | U | 51.5 | 103 | 75-120 | 2 | 0-20 |
| 79-01-6 | PSD | Trichloroethylene | 50.0 | 0.00 | U | 54.2 | 108 | 75-125 | 2 | 0-20 |
| 78-87-5 | PSD | 1,2-Dichloropropane | 50.0 | 0.00 | U | 48.4 | 97 | 75-120 | 1 | 0-20 |
| 74-95-3 | PSD | Dibromomethane | 50.0 | 0.00 | U | 51.2 | 102 | 77-122 | 0 | 0-20 |
| 75-27-4 | PSD | Bromodichloromethane | 50.0 | 0.00 | U | 51.7 | 103 | 76-129 | 1 | 0-20 |
| 10061-01-5 | PSD | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 52.2 | 104 | 75-127 | 1 | 0-20 |
| 108-88-3 | PSD | Toluene | 50.0 | 0.00 | U | 50.0 | 100 | 72-120 | 2 | 0-20 |
| 10061-02-6 | PSD | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 49.2 | 98 | 73-123 | 0 | 0-20 |
| 79-00-5 | PSD | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 47.7 | 95 | 77-120 | 0 | 0-20 |
| 142-28-9 | PSD | 1,3-Dichloropropane | 50.0 | 0.00 | U | 47.5 | 95 | 73-120 | 0 | 0-20 |
| 127-18-4 | PSD | Tetrachloroethylene | 50.0 | 0.00 | U | 56.8 | 114 | 67-124 | 3 | 0-20 |
| 124-48-1 | PSD | Dibromochloromethane | 50.0 | 0.00 | U | 54.9 | 110 | 70-130 | 1 | 0-20 |
| 108-90-7 | PSD | Chlorobenzene | 50.0 | 0.00 | U | 52.1 | 104 | 74-120 | 2 | 0-20 |
| 100-41-4 | PSD | Ethylbenzene | 50.0 | 0.00 | U | 50.9 | 102 | 72-120 | 2 | 0-20 |
| 95-47-6 | PSD | o-Xylene | 50.0 | 0.00 | U | 51.2 | 102 | 72-120 | 2 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119465**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:34**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 100-42-5 | PSD | Styrene | 50.0 | 0.00 | U | 51.2 | 102 | 74-124 | 1 | 0-20 |
| 75-25-2 | PSD | Bromoform | 50.0 | 0.00 | U | 52.0 | 104 | 61-135 | 0 | 0-20 |
| 98-82-8 | PSD | Isopropylbenzene | 50.0 | 0.00 | U | 51.7 | 103 | 71-124 | 4 | 0-20 |
| 79-34-5 | PSD | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 48.0 | 96 | 74-124 | 0 | 0-20 |
| 96-18-4 | PSD | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 47.6 | 95 | 71-125 | 0 | 0-20 |
| 108-86-1 | PSD | Bromobenzene | 50.0 | 0.00 | U | 51.3 | 103 | 72-120 | 2 | 0-20 |
| 103-65-1 | PSD | n-Propylbenzene | 50.0 | 0.00 | U | 48.8 | 98 | 69-121 | 3 | 0-20 |
| 108-67-8 | PSD | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 51.6 | 103 | 71-123 | 3 | 0-20 |
| 95-49-8 | PSD | 2-Chlorotoluene | 50.0 | 0.00 | U | 52.1 | 104 | 71-120 | 3 | 0-20 |
| 106-43-4 | PSD | 4-Chlorotoluene | 50.0 | 0.00 | U | 49.0 | 98 | 70-120 | 2 | 0-20 |
| 98-06-6 | PSD | tert-Butylbenzene | 50.0 | 0.00 | U | 55.1 | 110 | 72-124 | 4 | 0-20 |
| 95-63-6 | PSD | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 49.1 | 98 | 71-122 | 2 | 0-20 |
| 135-98-8 | PSD | sec-Butylbenzene | 50.0 | 0.00 | U | 53.0 | 106 | 71-124 | 3 | 0-20 |
| 99-87-6 | PSD | 4-Isopropyltoluene | 50.0 | 0.00 | U | 53.0 | 106 | 70-124 | 2 | 0-20 |
| 541-73-1 | PSD | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 52.3 | 105 | 70-120 | 1 | 0-20 |
| 106-46-7 | PSD | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 50.2 | 100 | 70-120 | 1 | 0-20 |
| 104-51-8 | PSD | n-Butylbenzene | 50.0 | 0.00 | U | 51.3 | 103 | 69-125 | 2 | 0-20 |
| 87-68-3 | PSD | Hexachlorobutadiene | 50.0 | 0.00 | U | 61.5 | 123 | 60-129 | 1 | 0-20 |
| 91-20-3 | PSD | Naphthalene | 50.0 | 0.00 | U | 56.4 | 113 | 58-134 | 1 | 0-20 |
| 87-61-6 | PSD | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 61.6 | 123 | 52-132 | 1 | 0-20 |
| 120-82-1 | PSD | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 58.3 | 117 | 59-126 | 1 | 0-20 |
| 630-20-6 | PSD | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 54.3 | 109 | 78-128 | 0 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119465**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 20:34**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-50-1 | PSD | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 51.9 | 104 | 72-120 | 1 | 0-20 |
| 71-36-3 | PSD | n-Butyl alcohol | 5000 | 0.00 | U | 4570 | 91 | 64-138 | 3 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119466**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 11:13**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 97.2 | 97 | 80-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 879 | 70 | 63-131 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 152 | 61 | 50-149 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 257 | 103 | 75-120 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 248 | 99 | 80-136 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 289 | 115 | 78-130 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 150 | 60 | 57-148 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 190 | 76 | 75-130 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 160 | 64 | 64-149 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 42.3 | 85 | 58-129 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 37.4 | 75 | 59-131 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 46.0 | 92 | 59-127 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 49.9 | 100 | 70-125 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 47.7 | 95 | 73-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 55.1 | 110 | 73-123 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 44.2 | 88 | 73-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 44.5 | 89 | 80-128 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 33.3 | 67 * | 75-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 46.6 | 93 | 74-122 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 44.7 | 89 | 80-121 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 45.0 | 90 | 79-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 44.1 | 88 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119466**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 11:13**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 50.2 | 100 | 79-130 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 51.6 | 103 | 80-121 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 47.1 | 94 | 79-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 49.2 | 98 | 80-128 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 47.5 | 95 | 80-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 52.2 | 104 | 80-131 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 43.8 | 88 | 73-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 47.4 | 95 | 78-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 50.2 | 100 | 80-121 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 45.4 | 91 | 79-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 48.2 | 96 | 80-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 48.6 | 97 | 80-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 50.0 | 100 | 80-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 46.4 | 93 | 78-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 47.3 | 95 | 79-121 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 44.9 | 90 | 78-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 44.7 | 89 | 75-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 52.5 | 105 | 74-123 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 51.8 | 104 | 73-129 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 48.6 | 97 | 79-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 47.2 | 94 | 79-120 |
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 47.3 | 95 | 80-123 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119466**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 11:13**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 47.8 | 96 | 80-121 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 49.8 | 100 | 65-135 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 47.3 | 95 | 79-121 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 44.8 | 90 | 76-123 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 45.4 | 91 | 76-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 48.5 | 97 | 79-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 44.8 | 90 | 80-123 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 47.3 | 95 | 80-120 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 47.9 | 96 | 79-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 45.1 | 90 | 79-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 49.8 | 100 | 79-122 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 45.4 | 91 | 80-120 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 48.7 | 97 | 80-121 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 48.8 | 98 | 80-121 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 49.0 | 98 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 47.0 | 94 | 78-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 47.5 | 95 | 80-123 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 58.3 | 117 | 71-128 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 52.6 | 105 | 64-132 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 58.7 | 117 | 61-132 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 56.0 | 112 | 66-130 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 51.2 | 102 | 80-125 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119466**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 11:13**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 48.6 | 97 | 78-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4350 | 87 | 67-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1399998**
**Lab Sample ID** **1203119467**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/01/2014 12:41**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 267 | 107 | 65-126 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 207 | 83 | 73-132 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 162 | 65 * | 67-127 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 206 | 82 | 74-122 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 216 | 87 | 73-124 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 192 | 77 | 68-123 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 203 | 81 | 79-120 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 195 | 78 | 77-120 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 1990 | 80 | 72-133 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 38.7 | 77 | 57-142 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PS**
**Lab Sample ID** **1203119472**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 21:03**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PS | Acrolein | 250 | 0.00 | U | 255 | 102 | 57-131 |
| 76-13-1 | PS | Trichlorotrifluoroethane | 250 | 0.00 | U | 232 | 93 | 76-133 |
| 107-05-1 | PS | Allyl chloride | 250 | 0.00 | U | 176 | 71 | 65-130 |
| 107-13-1 | PS | Acrylonitrile | 250 | 0.00 | U | 203 | 81 | 70-128 |
| 107-12-0 | PS | Propionitrile | 250 | 0.00 | U | 213 | 85 | 68-131 |
| 126-98-7 | PS | Methacrylonitrile | 250 | 0.00 | U | 190 | 76 | 64-129 |
| 80-62-6 | PS | Methyl methacrylate | 250 | 0.00 | U | 201 | 80 | 76-120 |
| 97-63-2 | PS | Ethyl methacrylate | 250 | 0.00 | U | 196 | 78 | 72-122 |
| 78-83-1 | PS | Isobutyl alcohol | 2500 | 0.00 | U | 1980 | 79 | 72-134 |
| 126-99-8 | PS | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 42.4 | 85 | 46-140 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458PSD**
**Lab Sample ID** **1203119473**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **07/01/2014 21:33**
**Dilution: 1**
**Batch ID:** **1399998**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PSD | Acrolein | 250 | 0.00 | U | 242 | 97 | 57-131 | 5 | 0-20 |
| 76-13-1 | PSD | Trichlorotrifluoroethane | 250 | 0.00 | U | 214 | 86 | 76-133 | 8 | 0-20 |
| 107-05-1 | PSD | Allyl chloride | 250 | 0.00 | U | 168 | 67 | 65-130 | 5 | 0-20 |
| 107-13-1 | PSD | Acrylonitrile | 250 | 0.00 | U | 192 | 77 | 70-128 | 6 | 0-20 |
| 107-12-0 | PSD | Propionitrile | 250 | 0.00 | U | 203 | 81 | 68-131 | 5 | 0-20 |
| 126-98-7 | PSD | Methacrylonitrile | 250 | 0.00 | U | 181 | 72 | 64-129 | 5 | 0-20 |
| 80-62-6 | PSD | Methyl methacrylate | 250 | 0.00 | U | 193 | 77 | 76-120 | 4 | 0-20 |
| 97-63-2 | PSD | Ethyl methacrylate | 250 | 0.00 | U | 188 | 75 | 72-122 | 4 | 0-20 |
| 78-83-1 | PSD | Isobutyl alcohol | 2500 | 0.00 | U | 1860 | 74 | 72-134 | 6 | 0-20 |
| 126-99-8 | PSD | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 40.4 | 81 | 46-140 | 5 | 0-20 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1399998** | **Instrument ID:** | **VOA6.I** | **Data File:** | **070114V6\6P208BAR.D** |
| **Lab Sample ID:** | **1203119463** | **Prep Date:** | **07/01/2014 13:41** | **Analyzed:** | **07/01/14 13:41** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| | Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 01 | LCS for batch 1399998 | 1203119466 | 070114V6\6P203LAR.D | 07/01/14 | 1113 |
| 02 | LCS for batch 1399998 | 1203119467 | 070114V6\6P206SHAR.D | 07/01/14 | 1241 |
| 03 | CALA-14-79460 | 351059005 | 070114V6\6P213.D | 07/01/14 | 1608 |
| 04 | CALA-14-79452 | 351059010 | 070114V6\6P214.D | 07/01/14 | 1637 |
| 05 | CALA-14-79458PS | 1203119464 | 070114V6\6P221.D | 07/01/14 | 2005 |
| 06 | CALA-14-79458PSD | 1203119465 | 070114V6\6P222.D | 07/01/14 | 2034 |
| 07 | CALA-14-79458PS | 1203119472 | 070114V6\6P223.D | 07/01/14 | 2103 |
| 08 | CALA-14-79458PSD | 1203119473 | 070114V6\6P224.D | 07/01/14 | 2133 |

# Quality Control Data

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119463** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 13:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 13:41** | | | | |
| **Data File:** | **070114V6\6P208BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119463** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 13:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 13:41** | | | | |
| **Data File:** | **070114V6\6P208BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119463** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 13:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 13:41** | | | | |
| **Data File:** | **070114V6\6P208BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 43.1 | 50.0 | ug/L | 86.1 | (78%-124%) |
| Bromofluorobenzene | 47.2 | 50.0 | ug/L | 94.4 | (80%-120%) |
| Toluene-d8 | 47.2 | 50.0 | ug/L | 94.4 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119464** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:05** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:05** | | | | |
| **Data File:** | **070114V6\6P221.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 54.2 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 53.3 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 47.8 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 47.6 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 48.5 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 48.1 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 50.5 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 60.9 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 47.4 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 57.7 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 48.1 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 51.5 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 46.8 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 47.7 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 50.0 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 51.6 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 47.4 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 49.7 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 53.3 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 94.6 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 50.6 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 116 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 47.9 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 52.0 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 192 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 70.1 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 959 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 50.3 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 54.7 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 51.1 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 51.9 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 54.3 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 269 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119464** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:05** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:05** | | | | |
| **Data File:** | **070114V6\6P221.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 55.8 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 51.1 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 50.6 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 50.5 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 39.8 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 54.5 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 51.0 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 43.3 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 45.6 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 49.7 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 60.8 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 278 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 49.8 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 36.6 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 55.8 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 50.5 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 55.4 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 49.2 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 53.3 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 56.7 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 291 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 49.0 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 47.6 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 51.6 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 103 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4680 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 47.3 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 50.1 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 51.5 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 49.4 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 52.9 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119464** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:05** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:05** | | | | |
| **Data File:** | **070114V6\6P221.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 47.9 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 49.4 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.1 | 50.0 | ug/L | 88.1 | (78%-124%) |
| Bromofluorobenzene | 46.0 | 50.0 | ug/L | 92.0 | (80%-120%) |
| Toluene-d8 | 47.1 | 50.0 | ug/L | 94.2 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119465** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:34** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:34** | | | | |
| **Data File:** | **070114V6\6P222.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 54.3 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 54.7 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 48.0 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 47.7 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 49.2 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 48.7 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 52.0 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 61.6 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 47.6 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 58.3 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 49.1 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 51.9 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 46.9 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 48.4 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 51.6 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 52.3 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 47.5 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 50.2 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 54.2 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 92.4 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 52.1 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 114 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 49.0 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 53.0 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 188 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 68.4 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 944 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 51.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 51.3 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 54.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 51.7 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 52.0 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 54.6 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 273 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119465** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:34** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:34** | | | | |
| **Data File:** | **070114V6\6P222.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 57.4 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 52.1 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 51.2 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 51.1 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 39.3 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 54.9 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 51.2 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 43.4 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 45.6 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 50.9 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 61.5 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 281 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 51.7 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 37.3 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 56.4 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 51.2 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 56.8 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 50.0 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 54.2 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 57.5 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 287 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 48.8 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 47.8 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 52.2 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 105 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4570 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 51.3 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 48.8 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 51.2 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 53.0 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 49.3 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 55.1 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119465** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 20:34** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 20:34** | | | | |
| **Data File:** | **070114V6\6P222.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 48.7 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 49.2 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.2 | 50.0 | ug/L | 88.4 | (78%-124%) |
| Bromofluorobenzene | 46.5 | 50.0 | ug/L | 93.0 | (80%-120%) |
| Toluene-d8 | 47.5 | 50.0 | ug/L | 94.9 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119466** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 11:13** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 11:13** | | | | |
| **Data File:** | **070114V6\6P203LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 51.2 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 49.2 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 44.8 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 44.9 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 45.0 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 44.5 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 47.5 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 58.7 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 45.4 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 56.0 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 45.4 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 48.6 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 43.8 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 45.4 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 47.3 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 49.0 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 44.7 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 47.0 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 50.2 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 150 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 47.9 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 160 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 45.1 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 48.8 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 190 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 152 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 879 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 47.4 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 48.5 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 51.6 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 48.6 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 49.8 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 49.9 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 248 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119466** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 11:13** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 11:13** | | | | |
| **Data File:** | **070114V6\6P203LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 52.2 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 48.6 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 47.7 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 47.1 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 37.4 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 51.8 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 48.2 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 42.3 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 44.2 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 47.2 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 58.3 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 257 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 47.3 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 33.3 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 52.6 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 47.8 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 52.5 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 46.4 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 50.2 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 55.1 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 289 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 46.0 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 44.1 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 50.0 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 97.2 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4350 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 47.5 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 44.8 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 47.3 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 48.7 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 46.6 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 49.8 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119466** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 11:13** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 11:13** | | | | |
| **Data File:** | **070114V6\6P203LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 44.7 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 47.3 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 43.2 | 50.0 | ug/L | 86.5 | (78%-124%) |
| Bromofluorobenzene | 45.3 | 50.0 | ug/L | 90.6 | (80%-120%) |
| Toluene-d8 | 46.5 | 50.0 | ug/L | 92.9 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119467** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 12:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 12:41** | | | | |
| **Data File:** | **070114V6\6P206SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 38.7 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 267 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 206 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 162 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119467** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 12:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 12:41** | | | | |
| **Data File:** | **070114V6\6P206SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 195 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 1990 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 192 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 203 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 216 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 207 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119467** | | | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1399998** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 12:41** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 12:41** | | | | |
| **Data File:** | **070114V6\6P206SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.1 | 50.0 | ug/L | 88.3 | (78%-124%) |
| Bromofluorobenzene | 47.2 | 50.0 | ug/L | 94.4 | (80%-120%) |
| Toluene-d8 | 46.8 | 50.0 | ug/L | 93.7 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119472** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:03** | | | | |
| **Data File:** | **070114V6\6P223.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 42.4 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 255 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 203 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 176 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119472** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:03** | | | | |
| **Data File:** | **070114V6\6P223.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 196 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 1980 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 190 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 201 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 213 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 232 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119472** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:03** | | | | |
| **Data File:** | **070114V6\6P223.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 44.9 | 50.0 | ug/L | 89.9 | (78%-124%) |
| Bromofluorobenzene | 47.6 | 50.0 | ug/L | 95.3 | (80%-120%) |
| Toluene-d8 | 47.7 | 50.0 | ug/L | 95.3 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119473** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:33** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:33** | | | | |
| **Data File:** | **070114V6\6P224.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 40.4 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 242 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 192 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 168 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119473** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:33** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:33** | | | | |
| **Data File:** | **070114V6\6P224.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 188 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 1860 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 181 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 193 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 203 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 214 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203119473** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1399998** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1399998** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **07/01/2014 21:33** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **07/01/2014 21:33** | | | | |
| **Data File:** | **070114V6\6P224.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 46.4 | 50.0 | ug/L | 92.9 | (78%-124%) |
| Bromofluorobenzene | 49.7 | 50.0 | ug/L | 99.4 | (80%-120%) |
| Toluene-d8 | 49.4 | 50.0 | ug/L | 98.8 | (80%-120%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 14-JUL-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| VOA GC/MS | SW846 8260B DOE-AL | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1399998 | See Below | | |

**Potentially affected work order(s)(SDG): 350951(2014-3574),351059(2014-3584)**

**Application Issues:**

Failed Recovery for MS/PS

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. QC samples 1203119464MS and 1203119465MSD did not pass recoveries for all analytes. | 1. The MS/MSD pair recovered in a similar manner. The results are reported. |
| 2. QC samples 1203119466LCS and 1203119467LCS did not pass recoveries for all analytes. | 2. The unaccetpable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. |

**Originator's Name:**

Gelester Baskett 16-JUL-14

**Data Validator/Group Leader:**

Erin Haubert 16-JUL-14

# Semi-Volatile Analysis

# Case Narrative

**Semi-Volatile Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry** |
| Analytical Method: | SW846 3510C/8270D |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1398264 |
| Prep Batch Number: | 1398263 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203114923 | Method Blank (MB) |
| 1203114924 | Laboratory Control Sample (LCS) |
| 1203114925 | 351059005(CALA-14-79460) Matrix Spike (MS) |
| 1203114926 | 351059005(CALA-14-79460) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 32.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at

GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

**CCV Requirements**
All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. Detected concentrations of these analytes should be considered as estimated.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG in this batch met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The 1203114924 (LCS) recovered 4-Nitrophenol at 15.1%(limits are 16-77%) and 1,2,4,5-Tetracholrobenzene at 33.8% (limits are 36-95%). These failures are less than 5% of the total requested analytes. The data are reported.

**QC Sample Designation**
Sample 351059005 (CALA-14-79460) was selected for analysis as the matrix spike and matrix spike duplicate.

**Matrix Spike (MS) Recovery Statement**
The MS, 1203114925 (CALA-14-79460), recovered 4-Nitrophenol at 0% (limits are 16-71%), Hexachlorocyclopentadiene at 0% (limits are 14-73%) and Benzoic acid at 0% (limits are 10-105%). The MS and MSD recovered the spikes in a similar manner. The failures are attributed to matrix interference. The data are reported.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD, 1203114926 (CALA-14-79460), recovered 4-Nitrophenol at 0% (limits are 16-71%), Hexachlorocyclopentadiene at 0% (limits are 14-73%) and Benzoic acid at 0% (limits are 10-105%). The MS and MSD recovered the spikes in a similar manner. The failures are attributed to matrix interference. The data are reported.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPD value between the MS and MSD, 1203114925 (CALA-14-79460) and 1203114926 (CALA-14-79460), was not within the 0-30% limits for Benzidine at 64.3%. This failure is attributed to matrix interference. The data are reported.

**Internal Standard (ISTD) Acceptance**
Sample 351059005 (CALA-14-79460) failed ISTD acceptance criteria. The sample was re-analyzed and passed the acceptance criteria. The initial analysis data results are reported.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the

associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Sample 351059005 (CALA-14-79460) was re-analyzed due to internal standard responses outside of the acceptance criteria.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception report 1309179 was generated for the samples in this batch for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for samples 1203114923 (MB) and 351059005 (CALA-14-79460) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| MSD5.I | Agilent 6890/5973 GC/MS w/ 7683 Autosampler | HP6890/HP5973 | DB-5MS | 25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

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## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 15 JUL 2014**  **Title: Data Validator**

# Sample Data Summary

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059005** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 17:50** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2614.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059005** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 17:50** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2614.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 56.2 | 100 | ug/L | 56.2 | (26%-129%) |
| 2-Fluorobiphenyl | 22.2 | 50.0 | ug/L | 44.4 | (32%-102%) |
| 2-Fluorophenol | 30.4 | 100 | ug/L | 30.4 | (10%-78%) |
| Nitrobenzene-d5 | 23.8 | 50.0 | ug/L | 47.6 | (36%-125%) |
| Phenol-d5 | 20.1 | 100 | ug/L | 20.1 | (10%-104%) |
| p-Terphenyl-d14 | 32.8 | 50.0 | ug/L | 65.7 | (34%-135%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 1.949 | 21.1 | ug/L | 0 | J |
| | unknown | 1.991 | 5.09 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059005** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 17:50** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062614.b\s5F2614.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.058 | 92.2 | ug/L | 0 | J |

# Quality Control Summary

**Semi-Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-3584**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 2FP %REC | PHL %REC | NBZ %REC | FBP %REC | TBP %REC | TPH %REC |
|---|---|---|---|---|---|---|---|
| 1203114923 | MB for batch 1398263 | 41 | 25 | 62 | 48 | 54 | 79 |
| 1203114924 | LCS for batch 1398263 | 39 | 26 | 67 | 58 | 72 | 76 |
| 1203114925 | CALA-14-79460MS | 54 | 44 | 68 | 66 | 53 | 90 |
| 1203114926 | CALA-14-79460MSD | 56 | 45 | 70 | 64 | 58 | 91 |
| 351059005 | CALA-14-79460 | 30 | 20 | 48 | 44 | 56 | 66 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 2FP | = 2-Fluorophenol | (10%-78%) |
| PHL | = Phenol-d5 | (10%-104%) |
| NBZ | = Nitrobenzene-d5 | (36%-125%) |
| FBP | = 2-Fluorobiphenyl | (32%-102%) |
| TBP | = 2,4,6-Tribromophenol | (26%-129%) |
| TPH | = p-Terphenyl-d14 | (34%-135%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1398263**
**Lab Sample ID** **1203114924**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/25/2014 14:06**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 62-75-9 | LCS | N-Methyl-N-nitrosomethylam | 50.0 | 0.0 | 23.7 | 47 | 18-75 |
| 110-86-1 | LCS | Pyridine | 50.0 | 0.0 | 29.3 | 59 | 11-88 |
| 62-53-3 | LCS | Aniline | 50.0 | 0.0 | 39.0 | 78 | 35-107 |
| 108-95-2 | LCS | Phenol | 50.0 | 0.0 | 13.3 | 27 | 13-77 |
| 111-44-4 | LCS | bis(2-Chloroethyl) ether | 50.0 | 0.0 | 31.4 | 63 | 35-111 |
| 95-57-8 | LCS | 2-Chlorophenol | 50.0 | 0.0 | 30.9 | 62 | 39-99 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 15.3 | 31 | 25-100 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 15.9 | 32 | 24-88 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 16.8 | 34 | 27-87 |
| 108-60-1 | LCS | bis(2-Chloro-1-methylethyl)et | 50.0 | 0.0 | 29.9 | 60 | 23-120 |
| 100-51-6 | LCS | Benzyl alcohol | 50.0 | 0.0 | 29.8 | 60 | 33-90 |
| 95-48-7 | LCS | o-Cresol | 50.0 | 0.0 | 29.8 | 60 | 32-90 |
| 65794-96-9 | LCS | m,p-Cresols | 50.0 | 0.0 | 31.0 | 62 | 28-100 |
| 621-64-7 | LCS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 50.0 | 0.0 | 38.3 | 77 | 39-113 |
| 67-72-1 | LCS | Hexachloroethane | 50.0 | 0.0 | 15.1 | 30 | 20-85 |
| 98-95-3 | LCS | Nitrobenzene | 50.0 | 0.0 | 32.3 | 65 | 41-119 |
| 78-59-1 | LCS | Isophorone | 50.0 | 0.0 | 37.8 | 76 | 49-133 |
| 88-75-5 | LCS | 2-Nitrophenol | 50.0 | 0.0 | 31.2 | 62 | 42-111 |
| 105-67-9 | LCS | 2,4-Dimethylphenol | 50.0 | 0.0 | 33.0 | 66 | 43-99 |
| 111-91-1 | LCS | bis(2-Chloroethoxy)methane | 50.0 | 0.0 | 34.1 | 68 | 44-109 |
| 120-83-2 | LCS | 2,4-Dichlorophenol | 50.0 | 0.0 | 32.3 | 65 | 45-106 |
| 65-85-0 | LCS | Benzoic acid | 100 | 0.0 | 22.5 | 23 | 10-81 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1398263**
**Lab Sample ID** **1203114924**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/25/2014 14:06**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-47-8 | LCS | 4-Chloroaniline | 50.0 | 0.0 | 36.9 | 74 | 50-122 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 13.7 | 27 | 19-92 |
| 59-50-7 | LCS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 50.0 | 0.0 | 36.6 | 73 | 46-111 |
| 77-47-4 | LCS | Hexachlorocyclopentadiene | 50.0 | 0.0 | 11.7 | 23 | 15-72 |
| 88-06-2 | LCS | 2,4,6-Trichlorophenol | 50.0 | 0.0 | 35.7 | 71 | 41-109 |
| 95-95-4 | LCS | 2,4,5-Trichlorophenol | 50.0 | 0.0 | 34.1 | 68 | 41-111 |
| 91-58-7 | LCS | 2-Chloronaphthalene | 50.0 | 0.0 | 21.6 | 43 | 36-98 |
| 88-74-4 | LCS | 2-Nitroaniline<br>*o-Nitroaniline* | 50.0 | 0.0 | 38.2 | 76 | 44-117 |
| 99-09-2 | LCS | 3-Nitroaniline<br>*m-Nitroaniline* | 50.0 | 0.0 | 33.8 | 68 | 45-124 |
| 131-11-3 | LCS | Dimethylphthalate | 50.0 | 0.0 | 40.8 | 82 | 53-112 |
| 606-20-2 | LCS | 2,6-Dinitrotoluene | 50.0 | 0.0 | 37.7 | 75 | 52-117 |
| 121-14-2 | LCS | 2,4-Dinitrotoluene | 50.0 | 0.0 | 39.0 | 78 | 45-124 |
| 51-28-5 | LCS | 2,4-Dinitrophenol | 50.0 | 0.0 | 25.9 | 52 | 19-110 |
| 132-64-9 | LCS | Dibenzofuran | 50.0 | 0.0 | 29.6 | 59 | 45-107 |
| 58-90-2 | LCS | 2,3,4,6-Tetrachlorophenol | 50.0 | 0.0 | 35.9 | 72 | 45-120 |
| 84-66-2 | LCS | Diethylphthalate | 50.0 | 0.0 | 42.5 | 85 | 51-116 |
| 100-02-7 | LCS | 4-Nitrophenol | 50.0 | 0.0 | 7.55 | 15 * | 16-77 |
| 7005-72-3 | LCS | 4-Chlorophenylphenylether | 50.0 | 0.0 | 32.0 | 64 | 40-114 |
| 100-01-6 | LCS | 4-Nitroaniline<br>*p-Nitroaniline* | 50.0 | 0.0 | 32.3 | 65 | 38-133 |
| 534-52-1 | LCS | 2-Methyl-4,6-dinitrophenol | 50.0 | 0.0 | 34.8 | 70 | 34-114 |
| 122-39-4 | LCS | Diphenylamine | 50.0 | 0.0 | 33.5 | 67 | 47-111 |
| 122-66-7 | LCS | Azobenzene<br>*1,2-Diphenylhydrazine* | 50.0 | 0.0 | 38.9 | 78 | 40-112 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1398263**
**Lab Sample ID** **1203114924**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/25/2014 14:06**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 101-55-3 | LCS | 4-Bromophenylphenylether | 50.0 | 0.0 | 33.2 | 66 | 41-113 |
| 84-74-2 | LCS | Di-n-butylphthalate | 50.0 | 0.0 | 41.6 | 83 | 49-116 |
| 85-68-7 | LCS | Butylbenzylphthalate | 50.0 | 0.0 | 41.4 | 83 | 40-122 |
| 117-81-7 | LCS | bis(2-Ethylhexyl)phthalate | 50.0 | 0.0 | 41.8 | 84 | 37-124 |
| 117-84-0 | LCS | Di-n-octylphthalate | 50.0 | 0.0 | 44.6 | 89 | 33-122 |
| 123-91-1 | LCS | 1,4-Dioxane | 50.0 | 0.0 | 22.1 | 44 | 26-73 |
| 930-55-2 | LCS | N-Nitrosopyrrolidine | 50.0 | 0.0 | 36.5 | 73 | 42-106 |
| 95-94-3 | LCS | 1,2,4,5-Tetrachlorobenzene | 50.0 | 0.0 | 16.9 | 34 * | 36-95 |
| 1912-24-9 | LCS | Atrazine | 50.0 | 0.0 | 41.4 | 83 | 47-115 |
| 92-87-5 | LCS | Benzidine | 100 | 0.0 | 28.4 | 28 | 10-124 |
| 91-94-1 | LCS | 3,3'-Dichlorobenzidine | 50.0 | 0.0 | 36.0 | 72 | 31-113 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 15.8 | 32 | 26-92 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114925**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:19**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MS | N-Methyl-N-nitrosomethylam | 112 | 0.00 | U | 68.9 | 61 | 21-88 |
| 110-86-1 | MS | Pyridine | 112 | 0.00 | U | 71.8 | 64 | 14-94 |
| 62-53-3 | MS | Aniline | 112 | 0.00 | U | 87.7 | 78 | 24-109 |
| 108-95-2 | MS | Phenol | 112 | 0.00 | U | 61.1 | 54 | 10-88 |
| 111-44-4 | MS | bis(2-Chloroethyl) ether | 112 | 0.00 | U | 77.5 | 69 | 25-114 |
| 95-57-8 | MS | 2-Chlorophenol | 112 | 0.00 | U | 78.6 | 70 | 31-103 |
| 541-73-1 | MS | 1,3-Dichlorobenzene | 112 | 0.00 | U | 42.2 | 38 | 18-83 |
| 106-46-7 | MS | 1,4-Dichlorobenzene | 112 | 0.00 | U | 42.7 | 38 | 20-86 |
| 95-50-1 | MS | 1,2-Dichlorobenzene | 112 | 0.00 | U | 46.0 | 41 | 21-85 |
| 108-60-1 | MS | bis(2-Chloro-1-methylethyl)et | 112 | 0.00 | U | 74.1 | 66 | 16-121 |
| 100-51-6 | MS | Benzyl alcohol | 112 | 0.00 | U | 79.6 | 71 | 31-100 |
| 95-48-7 | MS | o-Cresol | 112 | 0.00 | U | 79.2 | 70 | 26-97 |
| 65794-96-9 | MS | m,p-Cresols | 112 | 0.00 | U | 87.1 | 78 | 24-110 |
| 621-64-7 | MS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 112 | 0.00 | U | 88.4 | 79 | 29-116 |
| 67-72-1 | MS | Hexachloroethane | 112 | 0.00 | U | 37.4 | 33 | 17-82 |
| 98-95-3 | MS | Nitrobenzene | 112 | 0.00 | U | 78.5 | 70 | 32-126 |
| 78-59-1 | MS | Isophorone | 112 | 0.00 | U | 85.7 | 76 | 36-139 |
| 88-75-5 | MS | 2-Nitrophenol | 112 | 0.00 | U | 75.9 | 68 | 29-117 |
| 105-67-9 | MS | 2,4-Dimethylphenol | 112 | 0.00 | U | 65.8 | 59 | 28-107 |
| 111-91-1 | MS | bis(2-Chloroethoxy)methane | 112 | 0.00 | U | 77.2 | 69 | 34-112 |
| 120-83-2 | MS | 2,4-Dichlorophenol | 112 | 0.00 | U | 68.9 | 61 | 34-111 |
| 65-85-0 | MS | Benzoic acid | 225 | 0.00 | U | 0.00 | 0 * | 10-105 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114925**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:19**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MS | 4-Chloroaniline | 112 | 0.00 | U | 82.0 | 73 | 28-123 |
| 87-68-3 | MS | Hexachlorobutadiene | 112 | 0.00 | U | 33.0 | 29 | 11-97 |
| 59-50-7 | MS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 112 | 0.00 | U | 72.9 | 65 | 31-119 |
| 77-47-4 | MS | Hexachlorocyclopentadiene | 112 | 0.00 | U | 0.00 | 0 * | 14-73 |
| 88-06-2 | MS | 2,4,6-Trichlorophenol | 112 | 0.00 | U | 77.0 | 69 | 31-113 |
| 95-95-4 | MS | 2,4,5-Trichlorophenol | 112 | 0.00 | U | 70.0 | 62 | 30-117 |
| 91-58-7 | MS | 2-Chloronaphthalene | 112 | 0.00 | U | 64.7 | 58 | 30-97 |
| 88-74-4 | MS | 2-Nitroaniline<br>*o-Nitroaniline* | 112 | 0.00 | U | 85.5 | 76 | 28-122 |
| 99-09-2 | MS | 3-Nitroaniline<br>*m-Nitroaniline* | 112 | 0.00 | U | 66.8 | 59 | 29-125 |
| 131-11-3 | MS | Dimethylphthalate | 112 | 0.00 | U | 93.2 | 83 | 41-116 |
| 606-20-2 | MS | 2,6-Dinitrotoluene | 112 | 0.00 | U | 84.3 | 75 | 40-123 |
| 121-14-2 | MS | 2,4-Dinitrotoluene | 112 | 0.00 | U | 85.2 | 76 | 34-126 |
| 51-28-5 | MS | 2,4-Dinitrophenol | 112 | 0.00 | U | 35.8 | 32 | 17-110 |
| 132-64-9 | MS | Dibenzofuran | 112 | 0.00 | U | 74.1 | 66 | 36-107 |
| 58-90-2 | MS | 2,3,4,6-Tetrachlorophenol | 112 | 0.00 | U | 53.8 | 48 | 29-126 |
| 84-66-2 | MS | Diethylphthalate | 112 | 0.00 | U | 89.4 | 80 | 41-117 |
| 100-02-7 | MS | 4-Nitrophenol | 112 | 0.00 | U | 0.00 | 0 * | 16-71 |
| 7005-72-3 | MS | 4-Chlorophenylphenylether | 112 | 0.00 | U | 73.8 | 66 | 30-112 |
| 100-01-6 | MS | 4-Nitroaniline<br>*p-Nitroaniline* | 112 | 0.00 | U | 59.9 | 53 | 25-133 |
| 534-52-1 | MS | 2-Methyl-4,6-dinitrophenol | 112 | 0.00 | U | 62.7 | 56 | 22-118 |
| 122-39-4 | MS | Diphenylamine | 112 | 0.00 | U | 84.9 | 76 | 34-111 |
| 122-66-7 | MS | Azobenzene<br>*1,2-Diphenylhydrazine* | 112 | 0.00 | U | 106 | 94 | 30-112 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114925**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:19**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MS | 4-Bromophenylphenylether | 112 | 0.00 | U | 91.0 | 81 | 32-111 |
| 84-74-2 | MS | Di-n-butylphthalate | 112 | 0.00 | U | 86.1 | 77 | 35-118 |
| 85-68-7 | MS | Butylbenzylphthalate | 112 | 0.00 | U | 90.5 | 81 | 29-121 |
| 117-81-7 | MS | bis(2-Ethylhexyl)phthalate | 112 | 0.00 | U | 94.3 | 84 | 29-120 |
| 117-84-0 | MS | Di-n-octylphthalate | 112 | 0.00 | U | 88.0 | 78 | 25-118 |
| 123-91-1 | MS | 1,4-Dioxane | 112 | 0.00 | U | 60.6 | 54 | 26-88 |
| 930-55-2 | MS | N-Nitrosopyrrolidine | 112 | 0.00 | U | 90.1 | 80 | 42-110 |
| 95-94-3 | MS | 1,2,4,5-Tetrachlorobenzene | 112 | 0.00 | U | 50.4 | 45 | 29-96 |
| 1912-24-9 | MS | Atrazine | 112 | 0.00 | U | 81.5 | 73 | 33-121 |
| 92-87-5 | MS | Benzidine | 225 | 0.00 | U | 37.2 | 17 | 10-117 |
| 91-94-1 | MS | 3,3'-Dichlorobenzidine | 112 | 0.00 | U | 86.0 | 77 | 22-111 |
| 120-82-1 | MS | 1,2,4-Trichlorobenzene | 112 | 0.00 | U | 44.2 | 39 | 20-90 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MSD**
**Lab Sample ID** **1203114926**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:50**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MSD | N-Methyl-N-nitrosomethylam | 112 | 0.00 | U | 68.3 | 61 | 21-88 | 1 | 0-30 |
| 110-86-1 | MSD | Pyridine | 112 | 0.00 | U | 79.0 | 70 | 14-94 | 10 | 0-30 |
| 62-53-3 | MSD | Aniline | 112 | 0.00 | U | 89.2 | 79 | 24-109 | 2 | 0-30 |
| 108-95-2 | MSD | Phenol | 112 | 0.00 | U | 60.8 | 54 | 10-88 | 1 | 0-30 |
| 111-44-4 | MSD | bis(2-Chloroethyl) ether | 112 | 0.00 | U | 76.7 | 68 | 25-114 | 1 | 0-30 |
| 95-57-8 | MSD | 2-Chlorophenol | 112 | 0.00 | U | 77.4 | 69 | 31-103 | 2 | 0-30 |
| 541-73-1 | MSD | 1,3-Dichlorobenzene | 112 | 0.00 | U | 36.4 | 32 | 18-83 | 15 | 0-30 |
| 106-46-7 | MSD | 1,4-Dichlorobenzene | 112 | 0.00 | U | 36.9 | 33 | 20-86 | 15 | 0-30 |
| 95-50-1 | MSD | 1,2-Dichlorobenzene | 112 | 0.00 | U | 39.6 | 35 | 21-85 | 15 | 0-30 |
| 108-60-1 | MSD | bis(2-Chloro-1-methylethyl)et | 112 | 0.00 | U | 70.2 | 62 | 16-121 | 5 | 0-30 |
| 100-51-6 | MSD | Benzyl alcohol | 112 | 0.00 | U | 77.6 | 69 | 31-100 | 3 | 0-30 |
| 95-48-7 | MSD | o-Cresol | 112 | 0.00 | U | 80.5 | 72 | 26-97 | 2 | 0-30 |
| 65794-96-9 | MSD | m,p-Cresols | 112 | 0.00 | U | 87.8 | 78 | 24-110 | 1 | 0-30 |
| 621-64-7 | MSD | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 112 | 0.00 | U | 90.1 | 80 | 29-116 | 2 | 0-30 |
| 67-72-1 | MSD | Hexachloroethane | 112 | 0.00 | U | 31.3 | 28 | 17-82 | 18 | 0-30 |
| 98-95-3 | MSD | Nitrobenzene | 112 | 0.00 | U | 76.9 | 68 | 32-126 | 2 | 0-30 |
| 78-59-1 | MSD | Isophorone | 112 | 0.00 | U | 86.9 | 77 | 36-139 | 1 | 0-30 |
| 88-75-5 | MSD | 2-Nitrophenol | 112 | 0.00 | U | 78.3 | 70 | 29-117 | 3 | 0-30 |
| 105-67-9 | MSD | 2,4-Dimethylphenol | 112 | 0.00 | U | 76.2 | 68 | 28-107 | 15 | 0-30 |
| 111-91-1 | MSD | bis(2-Chloroethoxy)methane | 112 | 0.00 | U | 78.9 | 70 | 34-112 | 2 | 0-30 |
| 120-83-2 | MSD | 2,4-Dichlorophenol | 112 | 0.00 | U | 72.9 | 65 | 34-111 | 6 | 0-30 |
| 65-85-0 | MSD | Benzoic acid | 225 | 0.00 | U | 0.00 | 0 * | 10-105 | 0 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MSD**
**Lab Sample ID** **1203114926**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:50**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MSD | 4-Chloroaniline | 112 | 0.00 | U | 82.0 | 73 | 28-123 | 0 | 0-30 |
| 87-68-3 | MSD | Hexachlorobutadiene | 112 | 0.00 | U | 27.1 | 24 | 11-97 | 19 | 0-30 |
| 59-50-7 | MSD | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 112 | 0.00 | U | 76.0 | 68 | 31-119 | 4 | 0-30 |
| 77-47-4 | MSD | Hexachlorocyclopentadiene | 112 | 0.00 | U | 0.00 | 0 * | 14-73 | 0 | 0-30 |
| 88-06-2 | MSD | 2,4,6-Trichlorophenol | 112 | 0.00 | U | 77.3 | 69 | 31-113 | 0 | 0-30 |
| 95-95-4 | MSD | 2,4,5-Trichlorophenol | 112 | 0.00 | U | 75.1 | 67 | 30-117 | 7 | 0-30 |
| 91-58-7 | MSD | 2-Chloronaphthalene | 112 | 0.00 | U | 57.9 | 52 | 30-97 | 11 | 0-30 |
| 88-74-4 | MSD | 2-Nitroaniline<br>*o-Nitroaniline* | 112 | 0.00 | U | 85.5 | 76 | 28-122 | 0 | 0-30 |
| 99-09-2 | MSD | 3-Nitroaniline<br>*m-Nitroaniline* | 112 | 0.00 | U | 73.9 | 66 | 29-125 | 10 | 0-30 |
| 131-11-3 | MSD | Dimethylphthalate | 112 | 0.00 | U | 89.5 | 80 | 41-116 | 4 | 0-30 |
| 606-20-2 | MSD | 2,6-Dinitrotoluene | 112 | 0.00 | U | 83.8 | 75 | 40-123 | 1 | 0-30 |
| 121-14-2 | MSD | 2,4-Dinitrotoluene | 112 | 0.00 | U | 83.2 | 74 | 34-126 | 2 | 0-30 |
| 51-28-5 | MSD | 2,4-Dinitrophenol | 112 | 0.00 | U | 39.3 | 35 | 17-110 | 9 | 0-30 |
| 132-64-9 | MSD | Dibenzofuran | 112 | 0.00 | U | 68.6 | 61 | 36-107 | 8 | 0-30 |
| 58-90-2 | MSD | 2,3,4,6-Tetrachlorophenol | 112 | 0.00 | U | 56.7 | 50 | 29-126 | 5 | 0-30 |
| 84-66-2 | MSD | Diethylphthalate | 112 | 0.00 | U | 87.7 | 78 | 41-117 | 2 | 0-30 |
| 100-02-7 | MSD | 4-Nitrophenol | 112 | 0.00 | U | 0.00 | 0 * | 16-71 | 0 | 0-30 |
| 7005-72-3 | MSD | 4-Chlorophenylphenylether | 112 | 0.00 | U | 71.0 | 63 | 30-112 | 4 | 0-30 |
| 100-01-6 | MSD | 4-Nitroaniline<br>*p-Nitroaniline* | 112 | 0.00 | U | 64.9 | 58 | 25-133 | 8 | 0-30 |
| 534-52-1 | MSD | 2-Methyl-4,6-dinitrophenol | 112 | 0.00 | U | 65.3 | 58 | 22-118 | 4 | 0-30 |
| 122-39-4 | MSD | Diphenylamine | 112 | 0.00 | U | 83.9 | 75 | 34-111 | 1 | 0-30 |
| 122-66-7 | MSD | Azobenzene<br>*1,2-Diphenylhydrazine* | 112 | 0.00 | U | 99.7 | 89 | 30-112 | 6 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MSD**
**Lab Sample ID** **1203114926**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/25/2014 20:50**
**Prep Batch ID:** **1398263**
**Batch ID:** **1398264**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MSD | 4-Bromophenylphenylether | 112 | 0.00 | U | 83.8 | 75 | 32-111 | 8 | 0-30 |
| 84-74-2 | MSD | Di-n-butylphthalate | 112 | 0.00 | U | 88.2 | 79 | 35-118 | 2 | 0-30 |
| 85-68-7 | MSD | Butylbenzylphthalate | 112 | 0.00 | U | 91.2 | 81 | 29-121 | 1 | 0-30 |
| 117-81-7 | MSD | bis(2-Ethylhexyl)phthalate | 112 | 0.00 | U | 91.9 | 82 | 29-120 | 3 | 0-30 |
| 117-84-0 | MSD | Di-n-octylphthalate | 112 | 0.00 | U | 82.7 | 74 | 25-118 | 6 | 0-30 |
| 123-91-1 | MSD | 1,4-Dioxane | 112 | 0.00 | U | 63.4 | 56 | 26-88 | 4 | 0-30 |
| 930-55-2 | MSD | N-Nitrosopyrrolidine | 112 | 0.00 | U | 86.7 | 77 | 42-110 | 4 | 0-30 |
| 95-94-3 | MSD | 1,2,4,5-Tetrachlorobenzene | 112 | 0.00 | U | 44.1 | 39 | 29-96 | 14 | 0-30 |
| 1912-24-9 | MSD | Atrazine | 112 | 0.00 | U | 82.2 | 73 | 33-121 | 1 | 0-30 |
| 92-87-5 | MSD | Benzidine | 225 | 0.00 | U | 72.5 | 32 | 10-117 | 64 * | 0-30 |
| 91-94-1 | MSD | 3,3'-Dichlorobenzidine | 112 | 0.00 | U | 76.9 | 68 | 22-111 | 11 | 0-30 |
| 120-82-1 | MSD | 1,2,4-Trichlorobenzene | 112 | 0.00 | U | 36.0 | 32 | 20-90 | 20 | 0-30 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1398263** | **Instrument ID:** | **MSD5.I** | **Data File:** | **s062514.b\s5F2510.D** |
| **Lab Sample ID:** | **1203114923** | **Prep Date:** | **06/24/2014 15:20** | **Analyzed:** | **06/25/14 13:35** |
| **Column:** | **DB-5ms** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1398263 | 1203114924 | s062514.b\s5F2511.D | 06/25/14 | 1406 |
| 02 CALA-14-79460MS | 1203114925 | s062514.b\s5F2523.D | 06/25/14 | 2019 |
| 03 CALA-14-79460MSD | 1203114926 | s062514.b\s5F2524.D | 06/25/14 | 2050 |
| 04 CALA-14-79460 | 351059005 | s062614.b\s5F2614.D | 06/26/14 | 1750 |

# Quality Control Data

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114923** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 13:35** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114923** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 13:35** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 53.9 | 100 | ug/L | 53.9 | (26%-129%) |
| 2-Fluorobiphenyl | 23.9 | 50.0 | ug/L | 47.7 | (32%-102%) |
| 2-Fluorophenol | 41.2 | 100 | ug/L | 41.2 | (10%-78%) |
| Nitrobenzene-d5 | 30.8 | 50.0 | ug/L | 61.6 | (36%-125%) |
| Phenol-d5 | 24.9 | 100 | ug/L | 24.9 | (10%-104%) |
| p-Terphenyl-d14 | 39.5 | 50.0 | ug/L | 79.1 | (34%-135%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 1.982 | 29.4 | ug/L | 0 | J |
| | unknown | 2.025 | 6.92 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114923** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 13:35** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000994-05-8 | Butane, 2-methoxy-2-methyl- | 2.096 | 122 | ug/L | 90 | NJ |
| | unknown | 3.177 | 6.25 | ug/L | 0 | J |
| | unknown | 3.587 | 5.54 | ug/L | 0 | J |
| | unknown | 17.049 | 4.28 | ug/L | 0 | J |
| | unknown | 22.963 | 32.6 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114924** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 14:06** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2511.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 16.9 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 15.8 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 16.8 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | | 38.9 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 15.3 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 15.9 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | | 22.1 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 35.9 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 34.1 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 35.7 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 32.3 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 33.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 25.9 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 39.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 37.7 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | | 21.6 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | | 30.9 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 34.8 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | | 31.2 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 36.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 33.2 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | | 36.6 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 36.9 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 32.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | J | 7.55 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | | 39.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | | 41.4 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | | 28.4 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | | 22.5 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | | 29.8 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | | 41.4 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | | 41.6 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | | 44.6 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | | 29.6 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | | 42.5 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | | 40.8 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114924** | | | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398263** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 14:06** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2511.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 33.5 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | | 13.7 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 11.7 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | | 15.1 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | | 37.8 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 23.7 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 38.3 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 36.5 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | | 32.3 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | | 13.3 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | | 29.3 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 29.9 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 34.1 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 31.4 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 41.8 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | | 31.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 33.8 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | | 29.8 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 38.2 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 32.3 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 72.5 | 100 | ug/L | 72.5 | (26%-129%) |
| 2-Fluorobiphenyl | 29.0 | 50.0 | ug/L | 57.9 | (32%-102%) |
| 2-Fluorophenol | 38.9 | 100 | ug/L | 38.9 | (10%-78%) |
| Nitrobenzene-d5 | 33.4 | 50.0 | ug/L | 66.8 | (36%-125%) |
| Phenol-d5 | 25.5 | 100 | ug/L | 25.5 | (10%-104%) |
| p-Terphenyl-d14 | 38.2 | 50.0 | ug/L | 76.3 | (34%-135%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114925** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 20:19** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **445 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2523.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 50.4 | ug/L | 6.74 | 22.5 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 44.2 | ug/L | 6.74 | 22.5 |
| 95-50-1 | 1,2-Dichlorobenzene | | 46.0 | ug/L | 6.74 | 22.5 |
| 122-66-7 | Azobenzene | | 106 | ug/L | 6.74 | 22.5 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 42.2 | ug/L | 6.74 | 22.5 |
| 106-46-7 | 1,4-Dichlorobenzene | | 42.7 | ug/L | 6.74 | 22.5 |
| 123-91-1 | 1,4-Dioxane | | 60.6 | ug/L | 6.74 | 22.5 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 53.8 | ug/L | 6.74 | 22.5 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 70.0 | ug/L | 6.74 | 22.5 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 77.0 | ug/L | 6.74 | 22.5 |
| 120-83-2 | 2,4-Dichlorophenol | | 68.9 | ug/L | 6.74 | 22.5 |
| 105-67-9 | 2,4-Dimethylphenol | | 65.8 | ug/L | 6.74 | 22.5 |
| 51-28-5 | 2,4-Dinitrophenol | J | 35.8 | ug/L | 11.2 | 44.9 |
| 121-14-2 | 2,4-Dinitrotoluene | | 85.2 | ug/L | 6.74 | 22.5 |
| 606-20-2 | 2,6-Dinitrotoluene | | 84.3 | ug/L | 6.74 | 22.5 |
| 91-58-7 | 2-Chloronaphthalene | | 64.7 | ug/L | 0.921 | 2.25 |
| 95-57-8 | 2-Chlorophenol | | 78.6 | ug/L | 6.74 | 22.5 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 62.7 | ug/L | 6.74 | 22.5 |
| 88-75-5 | 2-Nitrophenol | | 75.9 | ug/L | 6.74 | 22.5 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 86.0 | ug/L | 6.74 | 22.5 |
| 101-55-3 | 4-Bromophenylphenylether | | 91.0 | ug/L | 6.74 | 22.5 |
| 59-50-7 | Parachlorometa cresol | | 72.9 | ug/L | 6.74 | 22.5 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 82.0 | ug/L | 7.42 | 22.5 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 73.8 | ug/L | 6.74 | 22.5 |
| 100-02-7 | 4-Nitrophenol | U | 22.5 | ug/L | 6.74 | 22.5 |
| 62-53-3 | Aniline | | 87.7 | ug/L | 9.44 | 22.5 |
| 1912-24-9 | Atrazine | | 81.5 | ug/L | 6.74 | 22.5 |
| 92-87-5 | Benzidine | | 37.2 | ug/L | 8.76 | 22.5 |
| 65-85-0 | Benzoic acid | U | 44.9 | ug/L | 13.5 | 44.9 |
| 100-51-6 | Benzyl alcohol | | 79.6 | ug/L | 6.74 | 22.5 |
| 85-68-7 | Butylbenzylphthalate | | 90.5 | ug/L | 6.74 | 22.5 |
| 84-74-2 | Di-n-butylphthalate | | 86.1 | ug/L | 6.74 | 22.5 |
| 117-84-0 | Di-n-octylphthalate | | 88.0 | ug/L | 6.74 | 22.5 |
| 132-64-9 | Dibenzofuran | | 74.1 | ug/L | 6.74 | 22.5 |
| 84-66-2 | Diethylphthalate | | 89.4 | ug/L | 6.74 | 22.5 |
| 131-11-3 | Dimethylphthalate | | 93.2 | ug/L | 6.74 | 22.5 |
| 88-85-7 | Dinoseb | U | 22.5 | ug/L | 6.74 | 22.5 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114925** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 20:19** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **445 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2523.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 84.9 | ug/L | 6.74 | 22.5 |
| 87-68-3 | Hexachlorobutadiene | | 33.0 | ug/L | 6.74 | 22.5 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 22.5 | ug/L | 6.74 | 22.5 |
| 67-72-1 | Hexachloroethane | | 37.4 | ug/L | 6.74 | 22.5 |
| 78-59-1 | Isophorone | | 85.7 | ug/L | 7.87 | 22.5 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 68.9 | ug/L | 6.74 | 22.5 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 22.5 | ug/L | 6.74 | 22.5 |
| 55-18-5 | N-Nitrosodiethylamine | U | 22.5 | ug/L | 6.74 | 22.5 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 88.4 | ug/L | 6.74 | 22.5 |
| 930-55-2 | N-Nitrosopyrrolidine | | 90.1 | ug/L | 6.74 | 22.5 |
| 98-95-3 | Nitrobenzene | | 78.5 | ug/L | 6.74 | 22.5 |
| 608-93-5 | Pentachlorobenzene | U | 22.5 | ug/L | 6.74 | 22.5 |
| 108-95-2 | Phenol | | 61.1 | ug/L | 6.74 | 22.5 |
| 110-86-1 | Pyridine | | 71.8 | ug/L | 6.74 | 22.5 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 74.1 | ug/L | 6.74 | 22.5 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 77.2 | ug/L | 6.74 | 22.5 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 77.5 | ug/L | 6.74 | 22.5 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 94.3 | ug/L | 6.74 | 22.5 |
| 65794-96-9 | m,p-Cresols | | 87.1 | ug/L | 8.31 | 22.5 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 66.8 | ug/L | 6.74 | 22.5 |
| 95-48-7 | o-Cresol | | 79.2 | ug/L | 6.74 | 22.5 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 85.5 | ug/L | 6.74 | 22.5 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 59.9 | ug/L | 6.74 | 22.5 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 119 | 225 | ug/L | 52.8 | (26%-129%) |
| 2-Fluorobiphenyl | 74.7 | 112 | ug/L | 66.4 | (32%-102%) |
| 2-Fluorophenol | 122 | 225 | ug/L | 54.2 | (10%-78%) |
| Nitrobenzene-d5 | 76.9 | 112 | ug/L | 68.5 | (36%-125%) |
| Phenol-d5 | 99.3 | 225 | ug/L | 44.2 | (10%-104%) |
| p-Terphenyl-d14 | 101 | 112 | ug/L | 90.1 | (34%-135%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114926** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 20:50** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **445 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2524.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 44.1 | ug/L | 6.74 | 22.5 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 36.0 | ug/L | 6.74 | 22.5 |
| 95-50-1 | 1,2-Dichlorobenzene | | 39.6 | ug/L | 6.74 | 22.5 |
| 122-66-7 | Azobenzene | | 99.7 | ug/L | 6.74 | 22.5 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 36.4 | ug/L | 6.74 | 22.5 |
| 106-46-7 | 1,4-Dichlorobenzene | | 36.9 | ug/L | 6.74 | 22.5 |
| 123-91-1 | 1,4-Dioxane | | 63.4 | ug/L | 6.74 | 22.5 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 56.7 | ug/L | 6.74 | 22.5 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 75.1 | ug/L | 6.74 | 22.5 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 77.3 | ug/L | 6.74 | 22.5 |
| 120-83-2 | 2,4-Dichlorophenol | | 72.9 | ug/L | 6.74 | 22.5 |
| 105-67-9 | 2,4-Dimethylphenol | | 76.2 | ug/L | 6.74 | 22.5 |
| 51-28-5 | 2,4-Dinitrophenol | J | 39.3 | ug/L | 11.2 | 44.9 |
| 121-14-2 | 2,4-Dinitrotoluene | | 83.2 | ug/L | 6.74 | 22.5 |
| 606-20-2 | 2,6-Dinitrotoluene | | 83.8 | ug/L | 6.74 | 22.5 |
| 91-58-7 | 2-Chloronaphthalene | | 57.9 | ug/L | 0.921 | 2.25 |
| 95-57-8 | 2-Chlorophenol | | 77.4 | ug/L | 6.74 | 22.5 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 65.3 | ug/L | 6.74 | 22.5 |
| 88-75-5 | 2-Nitrophenol | | 78.3 | ug/L | 6.74 | 22.5 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 76.9 | ug/L | 6.74 | 22.5 |
| 101-55-3 | 4-Bromophenylphenylether | | 83.8 | ug/L | 6.74 | 22.5 |
| 59-50-7 | Parachlorometa cresol | | 76.0 | ug/L | 6.74 | 22.5 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 82.0 | ug/L | 7.42 | 22.5 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 71.0 | ug/L | 6.74 | 22.5 |
| 100-02-7 | 4-Nitrophenol | U | 22.5 | ug/L | 6.74 | 22.5 |
| 62-53-3 | Aniline | | 89.2 | ug/L | 9.44 | 22.5 |
| 1912-24-9 | Atrazine | | 82.2 | ug/L | 6.74 | 22.5 |
| 92-87-5 | Benzidine | | 72.5 | ug/L | 8.76 | 22.5 |
| 65-85-0 | Benzoic acid | U | 44.9 | ug/L | 13.5 | 44.9 |
| 100-51-6 | Benzyl alcohol | | 77.6 | ug/L | 6.74 | 22.5 |
| 85-68-7 | Butylbenzylphthalate | | 91.2 | ug/L | 6.74 | 22.5 |
| 84-74-2 | Di-n-butylphthalate | | 88.2 | ug/L | 6.74 | 22.5 |
| 117-84-0 | Di-n-octylphthalate | | 82.7 | ug/L | 6.74 | 22.5 |
| 132-64-9 | Dibenzofuran | | 68.6 | ug/L | 6.74 | 22.5 |
| 84-66-2 | Diethylphthalate | | 87.7 | ug/L | 6.74 | 22.5 |
| 131-11-3 | Dimethylphthalate | | 89.5 | ug/L | 6.74 | 22.5 |
| 88-85-7 | Dinoseb | U | 22.5 | ug/L | 6.74 | 22.5 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114926** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398263** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1398264** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **06/25/2014 20:50** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 15:20** | **Aliquot:** | **445 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s062514.b\s5F2524.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 83.9 | ug/L | 6.74 | 22.5 |
| 87-68-3 | Hexachlorobutadiene | | 27.1 | ug/L | 6.74 | 22.5 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 22.5 | ug/L | 6.74 | 22.5 |
| 67-72-1 | Hexachloroethane | | 31.3 | ug/L | 6.74 | 22.5 |
| 78-59-1 | Isophorone | | 86.9 | ug/L | 7.87 | 22.5 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 68.3 | ug/L | 6.74 | 22.5 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 22.5 | ug/L | 6.74 | 22.5 |
| 55-18-5 | N-Nitrosodiethylamine | U | 22.5 | ug/L | 6.74 | 22.5 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 90.1 | ug/L | 6.74 | 22.5 |
| 930-55-2 | N-Nitrosopyrrolidine | | 86.7 | ug/L | 6.74 | 22.5 |
| 98-95-3 | Nitrobenzene | | 76.9 | ug/L | 6.74 | 22.5 |
| 608-93-5 | Pentachlorobenzene | U | 22.5 | ug/L | 6.74 | 22.5 |
| 108-95-2 | Phenol | | 60.8 | ug/L | 6.74 | 22.5 |
| 110-86-1 | Pyridine | | 79.0 | ug/L | 6.74 | 22.5 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 70.2 | ug/L | 6.74 | 22.5 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 78.9 | ug/L | 6.74 | 22.5 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 76.7 | ug/L | 6.74 | 22.5 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 91.9 | ug/L | 6.74 | 22.5 |
| 65794-96-9 | m,p-Cresols | | 87.8 | ug/L | 8.31 | 22.5 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 73.9 | ug/L | 6.74 | 22.5 |
| 95-48-7 | o-Cresol | | 80.5 | ug/L | 6.74 | 22.5 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 85.5 | ug/L | 6.74 | 22.5 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 64.9 | ug/L | 6.74 | 22.5 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 130 | 225 | ug/L | 57.7 | (26%-129%) |
| 2-Fluorobiphenyl | 71.8 | 112 | ug/L | 63.9 | (32%-102%) |
| 2-Fluorophenol | 125 | 225 | ug/L | 55.8 | (10%-78%) |
| Nitrobenzene-d5 | 79.0 | 112 | ug/L | 70.3 | (36%-125%) |
| Phenol-d5 | 101 | 225 | ug/L | 44.9 | (10%-104%) |
| p-Terphenyl-d14 | 102 | 112 | ug/L | 90.8 | (34%-135%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 27-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| SEMIVOA GC/MS | SW846 3510C/8270D | Liquid | ARSL (ESHL) |
| **Batch ID:** | **Sample Numbers:** | | |
| 1398264 | See Below | | |

**Potentially affected work order(s)(SDG): 350951(2014-3574),351059(2014-3584)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The 1203114924LCS recovered 4-Nitrophenol at 15.1%(limits are 16-77%) and 1,2,4,5-Tetracholrobenzene at 33.8% (limits are 36-95%). | 1. These failures are less than 5% of the total requested analytes. The data are reported. |
| 2. The 1203114925MS recovered 4-Nitrophenol at 0% (limits are 16-71%), Hexachlorocyclopentadiene at 0% (limits are 14-73%) and Benzoic acid at 0% (limits are 10-105%). | 2. & 3. The MS and MSD recovered the spikes in a similar manner. The failures are attributed to matrix interference. The data are reported. |
| 3. The 1203114926MSD recovered 4-Nitrophenol at 0% (limits are 16-71%), Hexachlorocyclopentadiene at 0% (limits are 14-73%) and Benzoic acid at 0% (limits are 10-105%). | |
| 4. The RPD value between the 1203114925MS and 1203114926MSD was not within the 0-30% limits for Benzidine at 64.3%. | 4. This failure is attributed to matrix interference. The data are reported. |

**Originator's Name:**

Richard Bomar 27-JUN-14

**Data Validator/Group Leader:**

Herbert Maier 27-JUN-14

# HPLC Polynuclear Aromatic Hydrocarbon Analysis

**HPLC-PAH**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Polynuclear Aromatic Hydrocarbons** |
| Analytical Method: | SW846 8310 |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1398214 |
| Prep Batch Number: | 1398212 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

| Sample ID | Client ID |
|---|---|
| 351059003 | CALA-14-79460 |
| 1203114810 | Method Blank (MB) |
| 1203114811 | Laboratory Control Sample (LCS) |
| 1203114812 | 351059003(CALA-14-79460) Matrix Spike (MS) |
| 1203114813 | 351059003(CALA-14-79460) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

## Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**CCV Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 351059003 (CALA-14-79460) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
The second bottle for sample 351059003 (CALA-14-79460) was split into two equal volumes of 440 ml for purpose of extracting and analyzing a MS/MSD set. The spike aliquot was adjusted accordingly.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

**Additional Comments**
The Form 8 is used only as a sequence of the analysis.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the analyst, reviewer, and report specialist names associated with the generation of the data and package. The data validator will always sign and date the case narrative.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

**Chromatographic Columns**

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 09 JUL 2014**  **Title: Group Leader**

# Roadmap for ARSL 2014-3584 HPLC_PAH

This roadmap was analyzed by cww on 07-08-2014, 15:10.
This roadmap was reviewed by map on 07-08-2014, 16:43.
This roadmap was packaged by map on 07-09-2014, 10:03.

Sample

| exclude | manual | datafile | smpid | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3009.d | 351059003 | 30-JUN-2014 | 14:52 | 2014-3584.sub | CALA-14-79460 | 1 | 1398214 | |

QC Sample

| exclude | manual | datafile | smpid | sampletype | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3004A.d | 1203114810 | mb | 30-JUN-2014 | 11:21 | 2014-3584.sub | PAHBLK01 | 1 | 1398214 | |
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3005A.d | 1203114811 | lcs | 30-JUN-2014 | 12:03 | 2014-3584.sub | PAHBLK01LCS | 1 | 1398214 | Pass |
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3010.d | 1203114812 | ms | 30-JUN-2014 | 15:34 | 2014-3584.sub | CALA-14-79460MS | 1 | 1398214 | Pass |
| ☐ | N | /chem/hplce.i/p063014.b/ph5f3011.d | 1203114813 | msd | 30-JUN-2014 | 16:16 | 2014-3584.sub | CALA-14-79460MSD | 1 | 1398214 | Pass |

# Sample Data Summary

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059003** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 14:52** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5f3009.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.500 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.025 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | U | 0.500 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 142 | 250 | ug/L | 56.7 | (21%-96%) |

# QC Summary

**PAH by HPLC**

**Surrogate Recovery Report**

**SDG Number: 2014-3584**

**Matrix Type: LIQUID**

**PACK Column (1) : C-18, DAD/FLD**

| Sample ID | Client ID | DFBF %REC |
|---|---|---|
| 1203114810 | MB for batch 1398212 | 70 |
| 1203114811 | LCS for batch 1398212 | 67 |
| 351059003 | CALA-14-79460 | 57 |
| 1203114812 | CALA-14-79460MS | 49 |
| 1203114813 | CALA-14-79460MSD | 53 |

| Surrogate | Acceptance Limits |
|---|---|
| DFBF = Decafluorobiphenyl | (21%-96%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1398212**
**Lab Sample ID** **1203114811**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/30/2014 12:03**
**Prep Batch ID:** **1398212**
**Batch ID:** **1398214**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 39.9 | 80 | 54-108 |
| 91-57-6 | LCS | 2-Methylnaphthalene | 50.0 | 0.0 | 45.3 | 91 | 50-91 |
| 90-12-0 | LCS | 1-Methylnaphthalene | 50.0 | 0.0 | 42.7 | 85 | 55-96 |
| 208-96-8 | LCS | Acenaphthylene | 50.0 | 0.0 | 43.2 | 86 | 52-100 |
| 83-32-9 | LCS | Acenaphthene | 50.0 | 0.0 | 46.2 | 92 | 53-107 |
| 86-73-7 | LCS | Fluorene | 50.0 | 0.0 | 44.6 | 89 | 62-130 |
| 85-01-8 | LCS | Phenanthrene | 50.0 | 0.0 | 43.9 | 88 | 69-130 |
| 120-12-7 | LCS | Anthracene | 50.0 | 0.0 | 47.2 | 94 | 70-130 |
| 206-44-0 | LCS | Fluoranthene | 5.00 | 0.0 | 4.24 | 85 | 70-130 |
| 129-00-0 | LCS | Pyrene | 5.00 | 0.0 | 4.44 | 89 | 70-130 |
| 56-55-3 | LCS | Benzo(a)anthracene | 5.00 | 0.0 | 4.43 | 89 | 70-130 |
| 218-01-9 | LCS | Chrysene | 5.00 | 0.0 | 4.71 | 94 | 70-130 |
| 205-99-2 | LCS | Benzo(b)fluoranthene | 5.00 | 0.0 | 4.38 | 88 | 70-130 |
| 207-08-9 | LCS | Benzo(k)fluoranthene | 2.50 | 0.0 | 2.35 | 94 | 70-130 |
| 50-32-8 | LCS | Benzo(a)pyrene | 5.00 | 0.0 | 4.49 | 90 | 70-130 |
| 193-39-5 | LCS | Indeno(1,2,3-cd)pyrene | 5.00 | 0.0 | 4.59 | 92 | 57-114 |
| 53-70-3 | LCS | Dibenzo(a,h)anthracene | 5.00 | 0.0 | 4.57 | 91 | 30-118 |
| 191-24-2 | LCS | Benzo(ghi)perylene | 5.00 | 0.0 | 3.85 | 77 | 42-115 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114812**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/30/2014 15:34**
**Prep Batch ID:** **1398212**
**Batch ID:** **1398214**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 91-20-3 | MS | Naphthalene | 56.8 | 0.00 | U | 33.1 | 58 | 32-104 |
| 91-57-6 | MS | 2-Methylnaphthalene | 56.8 | 0.00 | U | 38.4 | 68 | 56-130 |
| 90-12-0 | MS | 1-Methylnaphthalene | 56.8 | 0.00 | U | 35.4 | 62 | 46-130 |
| 208-96-8 | MS | Acenaphthylene | 56.8 | 0.00 | U | 36.0 | 63 | 26-121 |
| 83-32-9 | MS | Acenaphthene | 56.8 | 0.00 | U | 38.7 | 68 | 27-118 |
| 86-73-7 | MS | Fluorene | 56.8 | 0.00 | U | 39.8 | 70 | 29-123 |
| 85-01-8 | MS | Phenanthrene | 56.8 | 0.00 | U | 40.7 | 72 | 35-126 |
| 120-12-7 | MS | Anthracene | 56.8 | 0.00 | U | 45.4 | 80 | 36-122 |
| 206-44-0 | MS | Fluoranthene | 5.68 | 0.00 | U | 4.00 | 70 | 32-134 |
| 129-00-0 | MS | Pyrene | 5.68 | 0.00 | U | 4.21 | 74 | 32-134 |
| 56-55-3 | MS | Benzo(a)anthracene | 5.68 | 0.00 | U | 4.20 | 74 | 35-129 |
| 218-01-9 | MS | Chrysene | 5.68 | 0.00 | U | 4.51 | 79 | 25-141 |
| 205-99-2 | MS | Benzo(b)fluoranthene | 5.68 | 0.00 | U | 4.18 | 74 | 29-133 |
| 207-08-9 | MS | Benzo(k)fluoranthene | 2.84 | 0.00 | U | 2.23 | 79 | 28-134 |
| 50-32-8 | MS | Benzo(a)pyrene | 5.68 | 0.00 | U | 4.23 | 74 | 25-135 |
| 193-39-5 | MS | Indeno(1,2,3-cd)pyrene | 5.68 | 0.00 | U | 4.33 | 76 | 25-135 |
| 53-70-3 | MS | Dibenzo(a,h)anthracene | 5.68 | 0.00 | U | 4.70 | 83 | 25-133 |
| 191-24-2 | MS | Benzo(ghi)perylene | 5.68 | 0.00 | U | 3.79 | 67 | 27-140 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MSD**
**Lab Sample ID** **1203114813**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **06/30/2014 16:16**
**Prep Batch ID:** **1398212**
**Batch ID:** **1398214**
**Dilution: 1**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|
| 91-20-3 | MSD Naphthalene | 56.8 | 0.00 | U | 35.2 | 62 | 32-104 | 6 | 0-20 |
| 91-57-6 | MSD 2-Methylnaphthalene | 56.8 | 0.00 | U | 41.1 | 72 | 56-130 | 7 | 0-20 |
| 90-12-0 | MSD 1-Methylnaphthalene | 56.8 | 0.00 | U | 38.5 | 68 | 46-130 | 8 | 0-20 |
| 208-96-8 | MSD Acenaphthylene | 56.8 | 0.00 | U | 39.0 | 69 | 26-121 | 8 | 0-20 |
| 83-32-9 | MSD Acenaphthene | 56.8 | 0.00 | U | 41.9 | 74 | 27-118 | 8 | 0-20 |
| 86-73-7 | MSD Fluorene | 56.8 | 0.00 | U | 42.0 | 74 | 29-123 | 5 | 0-20 |
| 85-01-8 | MSD Phenanthrene | 56.8 | 0.00 | U | 41.9 | 74 | 35-126 | 3 | 0-20 |
| 120-12-7 | MSD Anthracene | 56.8 | 0.00 | U | 46.0 | 81 | 36-122 | 1 | 0-20 |
| 206-44-0 | MSD Fluoranthene | 5.68 | 0.00 | U | 4.04 | 71 | 32-134 | 1 | 0-20 |
| 129-00-0 | MSD Pyrene | 5.68 | 0.00 | U | 4.25 | 75 | 32-134 | 1 | 0-20 |
| 56-55-3 | MSD Benzo(a)anthracene | 5.68 | 0.00 | U | 4.22 | 74 | 35-129 | 0 | 0-20 |
| 218-01-9 | MSD Chrysene | 5.68 | 0.00 | U | 4.57 | 80 | 25-141 | 1 | 0-20 |
| 205-99-2 | MSD Benzo(b)fluoranthene | 5.68 | 0.00 | U | 4.21 | 74 | 29-133 | 1 | 0-20 |
| 207-08-9 | MSD Benzo(k)fluoranthene | 2.84 | 0.00 | U | 2.25 | 79 | 28-134 | 1 | 0-20 |
| 50-32-8 | MSD Benzo(a)pyrene | 5.68 | 0.00 | U | 4.28 | 75 | 25-135 | 1 | 0-20 |
| 193-39-5 | MSD Indeno(1,2,3-cd)pyrene | 5.68 | 0.00 | U | 4.39 | 77 | 25-135 | 1 | 0-20 |
| 53-70-3 | MSD Dibenzo(a,h)anthracene | 5.68 | 0.00 | U | 4.79 | 84 | 25-133 | 2 | 0-20 |
| 191-24-2 | MSD Benzo(ghi)perylene | 5.68 | 0.00 | U | 3.85 | 68 | 27-140 | 2 | 0-20 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1398212** | **Instrument ID:** | **HPLCE.I** | **Data File:** | **ph5f3004.d** |
| **Lab Sample ID:** | **1203114810** | **Prep Date:** | **06/24/2014 06:45** | **Analyzed:** | **06/30/14 11:21** |
| **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1398212 | 1203114811 | ph5f3005.d | 06/30/14 | 1203 |
| 02 CALA-14-79460 | 351059003 | ph5f3009.d | 06/30/14 | 1452 |
| 03 CALA-14-79460MS | 1203114812 | ph5f3010.d | 06/30/14 | 1534 |
| 04 CALA-14-79460MSD | 1203114813 | ph5f3011.d | 06/30/14 | 1616 |

# QC Data

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114810** | | | | |
| **Client Sample:** | **QC for batch 1398212** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398212** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 11:21** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5f3004.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.500 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.025 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | U | 0.500 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 175 | 250 | ug/L | 70.0 | (21%-96%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114811** | | | | |
| **Client Sample:** | **QC for batch 1398212** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398212** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 12:03** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5f3005.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 42.7 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | | 45.3 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | | 46.2 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | | 43.2 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | | 47.2 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | | 4.43 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | | 4.49 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.38 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | | 3.85 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.35 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | | 4.71 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 4.57 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | | 4.24 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | | 44.6 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.59 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | | 39.9 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | | 43.9 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | | 4.44 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 168 | 250 | ug/L | 67.2 | (21%-96%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114812** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398212** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 15:34** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **440 mL** | **Final Volume:** | **.5 mL** |
| **Data File:** | **ph5f3010.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 35.4 | ug/L | 0.248 | 0.568 |
| 91-57-6 | 2-Methylnaphthalene | | 38.4 | ug/L | 0.170 | 0.568 |
| 83-32-9 | Acenaphthene | | 38.7 | ug/L | 0.170 | 0.568 |
| 208-96-8 | Acenaphthylene | | 36.0 | ug/L | 0.170 | 0.568 |
| 120-12-7 | Anthracene | | 45.4 | ug/L | 0.170 | 0.568 |
| 56-55-3 | Benzo(a)anthracene | | 4.20 | ug/L | 0.0182 | 0.0568 |
| 50-32-8 | Benzo(a)pyrene | | 4.23 | ug/L | 0.0182 | 0.0568 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.18 | ug/L | 0.0182 | 0.0568 |
| 191-24-2 | Benzo(ghi)perylene | | 3.79 | ug/L | 0.0182 | 0.0568 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.23 | ug/L | 0.00909 | 0.0284 |
| 218-01-9 | Chrysene | | 4.51 | ug/L | 0.0182 | 0.0568 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 4.70 | ug/L | 0.0182 | 0.0568 |
| 206-44-0 | Fluoranthene | | 4.00 | ug/L | 0.0182 | 0.0568 |
| 86-73-7 | Fluorene | | 39.8 | ug/L | 0.170 | 0.568 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.33 | ug/L | 0.0182 | 0.0568 |
| 91-20-3 | Naphthalene | | 33.1 | ug/L | 0.170 | 0.568 |
| 85-01-8 | Phenanthrene | | 40.7 | ug/L | 0.207 | 0.568 |
| 129-00-0 | Pyrene | | 4.21 | ug/L | 0.0182 | 0.0568 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 138 | 284 | ug/L | 48.6 | (21%-96%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114813** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398212** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MSD** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1398214** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **06/30/2014 16:16** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **06/24/2014 06:45** | **Aliquot:** | **440 mL** | **Final Volume:** | **.5 mL** |
| **Data File:** | **ph5f3011.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 38.5 | ug/L | 0.248 | 0.568 |
| 91-57-6 | 2-Methylnaphthalene | | 41.1 | ug/L | 0.170 | 0.568 |
| 83-32-9 | Acenaphthene | | 41.9 | ug/L | 0.170 | 0.568 |
| 208-96-8 | Acenaphthylene | | 39.0 | ug/L | 0.170 | 0.568 |
| 120-12-7 | Anthracene | | 46.0 | ug/L | 0.170 | 0.568 |
| 56-55-3 | Benzo(a)anthracene | | 4.22 | ug/L | 0.0182 | 0.0568 |
| 50-32-8 | Benzo(a)pyrene | | 4.28 | ug/L | 0.0182 | 0.0568 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.21 | ug/L | 0.0182 | 0.0568 |
| 191-24-2 | Benzo(ghi)perylene | | 3.85 | ug/L | 0.0182 | 0.0568 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.25 | ug/L | 0.00909 | 0.0284 |
| 218-01-9 | Chrysene | | 4.57 | ug/L | 0.0182 | 0.0568 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 4.79 | ug/L | 0.0182 | 0.0568 |
| 206-44-0 | Fluoranthene | | 4.04 | ug/L | 0.0182 | 0.0568 |
| 86-73-7 | Fluorene | | 42.0 | ug/L | 0.170 | 0.568 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.39 | ug/L | 0.0182 | 0.0568 |
| 91-20-3 | Naphthalene | | 35.2 | ug/L | 0.170 | 0.568 |
| 85-01-8 | Phenanthrene | | 41.9 | ug/L | 0.207 | 0.568 |
| 129-00-0 | Pyrene | | 4.25 | ug/L | 0.0182 | 0.0568 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 151 | 284 | ug/L | 53.0 | (21%-96%) |

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1397916 |
| Prep Batch Number: | 1397915 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203114155 | Interference Check Sample (ICS) |
| 1203114149 | Method Blank (MB) |
| 1203114150 | Laboratory Control Sample (LCS) |
| 1203114151 | 350951022(CALA-14-79448) Matrix Spike (MS) |
| 1203114152 | 350951022(CALA-14-79448) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
All associated initial calibration verification standards (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 350951022 (CALA-14-79448) from SDG 2014-3574 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Sample 351059008 (CALA-14-79466) was diluted to bring the over range concentration within the calibration range.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG except for dilutions.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 03 JUL 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CALA-14-79466

**Date Received:** 20-JUN-14

**GEL Job No (SDG):** 2014-3584

**GEL Sample ID:** 351059008

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .5 | 2 | 5.89 | ug/L | | 10 | 23-JUN-14 15:47 | per0623014a |
| | Perchlorate Isotope Ratio | | | 3 | | | 10 | 23-JUN-14 15:47 | per0623014a |
| 14797-73-0 | Perchlorate-101 | .5 | 2 | 5.85 | ug/L | | 10 | 23-JUN-14 15:47 | per0623014a |
| | Perchlorate-O(18) | | | 4.94 | ug/L | | 10 | 23-JUN-14 15:47 | per0623014a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2014-3584

**Extract Batch Code:** 1397915

**Date Filtered:** 22-JUN-14

**Matrix:** WATER

**Sample ID:** 1203114150

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .185 | ug/L | 92.6 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.03 | | | | - |
| Perchlorate-101 | 0.200 | .183 | ug/L | 91.5 | | 85 - 115 |
| Perchlorate-O(18) | | .483 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2014-3584

**Extract Batch Code:** 1397915

**Date Extracted:** 22-JUN-14

**GEL MS/PS ID:** 1203114151

**Client ID:** CALA-14-79448

**GEL MSD/PSD ID:** 1203114152

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.0113 | ug/L | 0.203 | 96 | .205 | 96.7 | .673 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.29 | | 3.13 | | 2.95 | | 5.86 | | - |
| Perchlorate-101 | 0.200 | 0.0102 | ug/L | 0.194 | 91.9 | .207 | 98.5 | 6.54 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.503 | ug/L | 0.496 | | .477 | | 3.81 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 22-JUN-14

**GEL Job No (SDG):** 2014-3584

**GEL Sample ID:** 1203114149

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 22-JUN-14 19:55 | per0622028a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 22-JUN-14 19:55 | per0622028a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 22-JUN-14 19:55 | per0622028a |
| | Perchlorate-O(18) | | | 0.484 | ug/L | | 1 | 22-JUN-14 19:55 | per0622028a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 22-JUN-14

**GEL Job No (SDG):** 2014-3584

**GEL Sample ID:** 1203114150

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.185 | ug/L | J | 1 | 22-JUN-14 20:05 | per0622029a |
| | Perchlorate Isotope Ratio | | | 3.03 | | | 1 | 22-JUN-14 20:05 | per0622029a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.183 | ug/L | J | 1 | 22-JUN-14 20:05 | per0622029a |
| | Perchlorate-O(18) | | | 0.483 | ug/L | | 1 | 22-JUN-14 20:05 | per0622029a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WASTE WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2014-3584

**GEL Sample ID:** 1203114155

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.185 | ug/L | J | 1 | 22-JUN-14 20:14 | per0622030a |
| | Perchlorate Isotope Ratio | | | 2.92 | | | 1 | 22-JUN-14 20:14 | per0622030a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.189 | ug/L | J | 1 | 22-JUN-14 20:14 | per0622030a |
| | Perchlorate-O(18) | | | 0.469 | ug/L | | 1 | 22-JUN-14 20:14 | per0622030a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CALA-14-79448MS

**Date Received:** 19-JUN-14

**GEL Job No (SDG):** 2014-3584

**GEL Sample ID:** 1203114151

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.203 | ug/L | | 1 | 22-JUN-14 21:39 | per0622039a |
| | Perchlorate Isotope Ratio | | | 3.13 | | | 1 | 22-JUN-14 21:39 | per0622039a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.194 | ug/L | J | 1 | 22-JUN-14 21:39 | per0622039a |
| | Perchlorate-O(18) | | | 0.496 | ug/L | | 1 | 22-JUN-14 21:39 | per0622039a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1397915

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CALA-14-79448MSD

**Date Received:** 19-JUN-14

**GEL Job No (SDG):** 2014-3584

**GEL Sample ID:** 1203114152

**Date Filtered:** 22-JUN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.205 | ug/L | | 1 | 22-JUN-14 21:49 | per0622040a |
| | Perchlorate Isotope Ratio | | | 2.95 | | | 1 | 22-JUN-14 21:49 | per0622040a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.207 | ug/L | | 1 | 22-JUN-14 21:49 | per0622040a |
| | Perchlorate-O(18) | | | 0.477 | ug/L | | 1 | 22-JUN-14 21:49 | per0622040a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Explosives by LCMSMS Analysis

# Case Narrative

**LC-MS/MS Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Analysis of Nitroaromatic Explosives Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by SW-846 Method 8321 Modified (8321M)** |
| Analytical Method: | SW846 3535/8321A Modified |
| Prep Method: | SW846 Method 3535 |
| Analytical Batch Number: | 1398124 |
| Prep Batch Number: | 1398120 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535/8321A Modified:

| Sample ID | Client ID |
|---|---|
| 351059004 | CALA-14-79460 |
| 1203114638 | Method Blank (MB) |
| 1203114639 | Laboratory Control Sample (LCS) |
| 1203114640 | 351059004(CALA-14-79460) Matrix Spike (MS) |
| 1203114641 | 351059004(CALA-14-79460) Matrix Spike Duplicate (MSD) |

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-056 REV# 17.

**Primary Analyte Analysis**

## Calibration Information

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
All low level calibration verification (CRI) requirements for this analysis were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS (1203114639) did not meet acceptance criteria for the recovery of Tetryl at 43.6%. The limits are 65-120%. Both the MS (1203114640) and MSD (1203114641) met acceptance criteria for all target analytes. The data are reported with the appropriate DER.

**QC Sample Designation**
Client sample 351059004 (CALA-14-79460) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS spike recoveries were within the established acceptance limits for this analysis.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD spike recoveries were within the established acceptance limits for this analysis.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits for this analysis.

**Internal Standard (ISTD) Acceptance**
A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000.

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

**Secondary Analyte Analysis**

**Calibration Information**

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
All low level calibration verification (CRI) requirements for this analysis were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries were within the established acceptance limits for this analysis.

**QC Sample Designation**
Client sample 351059004 (CALA-14-79460) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS spike recoveries were within the established acceptance limits for this analysis.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD spike recoveries were within the established acceptance limits for this analysis.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits for this analysis.

**Internal Standard (ISTD) Acceptance**
The internal standards were not added to the Secondary analyte extracts.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data Exception Report 1315080 was generated for this SDG.

The LCS (1203114639) did not meet acceptance criteria for the recovery of Tetryl at 43.6%. The limits are 65-120%. Both the MS (1203114640) and MSD (1203114641) met acceptance criteria for all target analytes. The data are reported with the appropriate DER.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples required manual integrations due to software limitations.

**Additional Comments**
Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct.

Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LC-MS/MS #1, and LC-MS/MS #2, respectively. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis.

The laboratory also utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC-MS/MS #3 or LC-MS/MS #4. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

The detection of the Primary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

The detection of the Secondary analytes is accomplished through analysis on the following reversed phase column:

YMC: J'sphere ODS-H80, 150 x 4.6mm I.D.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 − (843) 556−8171 − www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS−LANS−MTOA6−25093−GEL)

Client SDG: 2014−3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re−analyzed without re−extraction.
RE  Indicates that sample is re−extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 18 JUL 2014**  **Title: Group Leader**

# Sample Data Summary

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 351059004

**Sample Amount** 930 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714043.wiff

**Date Analyzed:** 15-JUL-14 11:59

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.269 | U | 0.086 | 0.269 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.269 | U | 0.086 | 0.269 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.269 | U | 0.0882 | 0.269 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.269 | U | 0.086 | 0.269 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.269 | U | 0.086 | 0.269 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.269 | U | 0.086 | 0.269 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.538 | U | 0.086 | 0.538 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 351059004

**Sample Amount** 930 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.538 | U | 0.108 | 0.538 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.538 | U | 0.161 | 0.538 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 351059004

**Sample Amount** 930 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160026.wiff

**Date Analyzed:** 16-JUL-14 18:02

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.08 | U | 0.323 | 1.08 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.08 | U | 0.323 | 1.08 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.08 | U | 0.323 | 1.08 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.69 | U | 0.538 | 2.69 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.69 | U | 0.538 | 2.69 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# Quality Control Summary

# High Explosives Surrogate Recovery Summary

**Lab Name:** GEL Laboratories LLC **GEL Job No (SDG):** 2014-3584

**Lab Code:** GEL **HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 351059004 | CALA-14-79460 | 82.4 | 69 - 120 | |
| 1203114638 | MB for batch 1398120 | 92.4 | 69 - 120 | |
| 1203114639 | LCS for batch 1398120 | 88.4 | 69 - 120 | |
| 1203114640 | CALA-14-79460MS | 85.2 | 69 - 120 | |
| 1203114641 | CALA-14-79460MSD | 87.2 | 69 - 120 | |

DNT = 3,4-Dinitrotoluene

**Lab Code:** GEL **HPLC Column:** YMC J'sphere ODS-H80

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 351059004 | CALA-14-79460 | 86.8 | 69 - 120 | |
| 1203114638 | MB for batch 1398120 | 93.2 | 69 - 120 | |
| 1203114639 | LCS for batch 1398120 | 86.4 | 69 - 120 | |
| 1203114640 | CALA-14-79460MS | 91.6 | 69 - 120 | |
| 1203114641 | CALA-14-79460MSD | 85.2 | 69 - 120 | |

DNT = 3,4-Dinitrotoluene

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Extract Batch Code:** 1398120

**Date Extracted:** 24-JUN-14

**GEL LCS ID:** 1203114639

**GEL LCSDUP ID:**

**Analysis Date/Time:** 15-JUL-14 11:24

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec | # | LCSD Conc | LCSD Rec | # | RPD | # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HMX | 5 | 4.72 | 94.4 | | | | | | | | 66 - 115 |
| Nitrobenzene | 5 | 4.45 | 89 | | | | | | | | 69 - 113 |
| PETN | 5 | 4.51 | 90.2 | | | | | | | | 67 - 121 |
| RDX | 5 | 5.01 | 100 | | | | | | | | 70 - 125 |
| Tetryl | 5 | 2.18 | 43.6 | * | | | | | | | 65 - 120 |
| m-Dinitrobenzene | 5 | 5.21 | 104 | | | | | | | | 70 - 115 |
| m-Nitrotoluene | 5 | 4.08 | 81.6 | | | | | | | | 69 - 113 |
| o-Nitrotoluene | 5 | 4.01 | 80.2 | | | | | | | | 66 - 111 |
| 2,4,6-Trinitrotoluene | 5 | 4.23 | 84.6 | | | | | | | | 70 - 121 |
| 4-Amino-2,6-dinitrotoluene | 5 | 4.92 | 98.4 | | | | | | | | 70 - 119 |
| 2-Amino-4,6-dinitrotoluene | 5 | 4.67 | 93.4 | | | | | | | | 70 - 121 |
| 2,6-Dinitrotoluene | 5 | 4.11 | 82.2 | | | | | | | | 70 - 109 |
| 2,4-Dinitrotoluene | 5 | 4.56 | 91.2 | | | | | | | | 70 - 115 |
| 1,3,5-Trinitrobenzene | 5 | 4.37 | 87.4 | | | | | | | | 70 - 117 |
| p-Nitrotoluene | 5 | 4.23 | 84.6 | | | | | | | | 67 - 113 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Extract Batch Code:** 1398120

**Date Extracted:** 24-JUN-14

**GEL LCS ID:** 1203114639

**GEL LCSDUP ID:**

**Analysis Date/Time:** 16-JUL-14 17:45

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec # | LCSD Conc | LCSD Rec # | RPD # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 5 | 4.08 | 81.6 | | | | | 70 - 109 |
| 2,6-Diamino-4-nitrotoluene | 5 | 4.23 | 84.6 | | | | | 61 - 117 |
| 3,5-Dinitroaniline | 5 | 3.8 | 76 | | | | | 70 - 117 |
| TATB | 5 | 3.51 | 70.2 | | | | | 32 - 169 |
| tris(o-cresyl) phosphate | 5 | 3.3 | 66 | | | | | 51 - 87 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

# High Explosives MS/MSD Summary

**Lab Name:** GEL Laboratories LLC

**Client ID:** CALA-14-79460

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Extract Batch Code:** 1398120

**Date Extracted:** 24-JUN-14

**GEL Spike ID:** 1203114640

**GEL SpikeDup ID:** 1203114641

**Analysis Date/Time:** 15-JUL-14 12:34

**MSD Analysis Date/Time:** 15-JUL-14 13:09

**Reporting Units:** ug/L

**QC Type:** MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Rec Limits |
|---|---|---|---|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | 5.20833 | 0 | 4.24 | 81.4 | 4.3 | 79.6 | 1.48 | 20 | 60 - 120 |
| 2,4,6-Trinitrotoluene | 5.20833 | 0 | 4.27 | 82 | 4.84 | 89.6 | 12.6 | 20 | 60 - 123 |
| 2,4-Dinitrotoluene | 5.20833 | 0 | 4.54 | 87.2 | 4.75 | 87.8 | 4.4 | 20 | 60 - 119 |
| 2,6-Dinitrotoluene | 5.20833 | 0 | 4.24 | 81.4 | 4.82 | 89.2 | 12.8 | 20 | 60 - 113 |
| 2-Amino-4,6-dinitrotoluene | 5.20833 | 0 | 4.95 | 95 | 5.09 | 94.2 | 2.87 | 20 | 60 - 124 |
| 4-Amino-2,6-dinitrotoluene | 5.20833 | 0 | 4.94 | 94.8 | 5.54 | 102 | 11.4 | 20 | 63 - 133 |
| HMX | 5.20833 | 0 | 4.25 | 81.6 | 4.69 | 86.8 | 9.88 | 20 | 59 - 117 |
| Nitrobenzene | 5.20833 | 0 | 4.45 | 85.4 | 4.28 | 79.2 | 3.82 | 20 | 63 - 112 |
| PETN | 5.20833 | 0 | 4.38 | 84 | 4.68 | 86.6 | 6.76 | 20 | 65 - 118 |
| RDX | 5.20833 | 0 | 4.7 | 90.2 | 4.84 | 89.6 | 3.05 | 20 | 67 - 131 |
| Tetryl | 5.20833 | 0 | 2.46 | 47.2 | 2.83 | 52.4 | 14.1 | 20 | 44 - 109 |
| m-Dinitrobenzene | 5.20833 | 0 | 5.28 | 101 | 5.54 | 102 | 4.69 | 20 | 60 - 117 |
| m-Nitrotoluene | 5.20833 | 0 | 4.29 | 82.4 | 4.64 | 85.8 | 7.75 | 20 | 61 - 110 |
| o-Nitrotoluene | 5.20833 | 0 | 4.17 | 80 | 4.39 | 81.2 | 5.2 | 20 | 57 - 112 |
| p-Nitrotoluene | 5.20833 | 0 | 4.51 | 86.6 | 4.61 | 85.2 | 2.08 | 20 | 63 - 111 |

#Column to be used to flag recovery and RPD values with an asterisk

# High Explosives MS/MSD Summary

**Lab Name:** GEL Laboratories LLC

**Client ID:** CALA-14-79460

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Extract Batch Code:** 1398120

**Date Extracted:** 24-JUN-14

**GEL Spike ID:** 1203114640

**GEL SpikeDup ID:** 1203114641

**Analysis Date/Time:** 16-JUL-14 18:19

**MSD Analysis Date/Time:** 16-JUL-14 18:35

**Reporting Units:** ug/L

**QC Type:** MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec | # | MSD Conc | MSD Rec | # | RPD | # | RPD Limit | Rec Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 5.20833 | 0 | 4.18 | 80.2 | | 4.26 | 78.8 | | 1.95 | | 20 | 68 - 116 |
| 2,6-Diamino-4-nitrotoluene | 5.20833 | 0 | 4.55 | 87.4 | | 4.57 | 84.6 | | .458 | | 20 | 53 - 124 |
| 3,5-Dinitroaniline | 5.20833 | 0 | 3.89 | 74.6 | | 4.05 | 75 | | 4.25 | | 20 | 67 - 123 |
| TATB | 5.20833 | 0 | 3.75 | 72 | | 3.58 | 66.2 | | 4.68 | | 20 | 39 - 112 |
| tris(o-cresyl) phosphate | 5.20833 | 0 | 3.73 | 71.6 | | 3.81 | 70.4 | | 2.02 | | 20 | 49 - 86 |

#Column to be used to flag recovery and RPD values with an asterisk

# Quality Control Data

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1398120

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114638

**Sample Amount** 1000 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXP0714041.wiff

**Date Analyzed:** 15-JUL-14 10:49

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.250 | U | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.250 | U | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.250 | U | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.500 | U | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1398120

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114638

**Sample Amount** 1000 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.500 | U | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.500 | U | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1398120

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114638

**Sample Amount** 1000 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160024.wiff

**Date Analyzed:** 16-JUL-14 17:28

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.00 | U | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.00 | U | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.00 | U | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.50 | U | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.50 | U | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1398120

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114639

**Sample Amount** 1000 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXP0714042.wiff

**Date Analyzed:** 15-JUL-14 11:24

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 2.18 | | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.01 | | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.08 | | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.11 | | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.23 | | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 99-99-0 | p-Nitrotoluene | 4.23 | | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.37 | | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 98-95-3 | Nitrobenzene | 4.45 | | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 78-11-5 | PETN | 4.51 | | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.56 | | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.67 | | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 4.72 | | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.92 | | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1398120

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114639

**Sample Amount** 1000 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 121-82-4 | RDX | 5.01 | | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.21 | | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1398120

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114639

**Sample Amount** 1000 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160025.wiff

**Date Analyzed:** 16-JUL-14 17:45

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 3.3 | | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 3058-38-6 | TATB | 3.51 | | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 3.8 | | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 4.08 | | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.23 | | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460(351059004MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114640

**Sample Amount** 960 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714044.wiff

**Date Analyzed:** 15-JUL-14 12:34

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 2.46 | | 0.0833 | 0.521 |
| *479-45-8* | *Tetryl* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.17 | | 0.0854 | 0.260 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.24 | | 0.0833 | 0.260 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.24 | | 0.0833 | 0.260 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 2691-41-0 | HMX | 4.25 | | 0.0833 | 0.260 |
| *2691-41-0* | *HMX* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.27 | | 0.0833 | 0.260 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.29 | | 0.0833 | 0.260 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 78-11-5 | PETN | 4.38 | | 0.104 | 0.521 |
| *78-11-5* | *PETN* | | | | |
| 98-95-3 | Nitrobenzene | 4.45 | | 0.0833 | 0.260 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-99-0 | p-Nitrotoluene | 4.51 | | 0.156 | 0.521 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.54 | | 0.0833 | 0.260 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 4.7 | | 0.0833 | 0.260 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.94 | | 0.0833 | 0.260 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460(351059004MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114640

**Sample Amount** 960 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.95 | | 0.0833 | 0.260 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.28 | | 0.0833 | 0.260 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460(351059004MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114640

**Sample Amount** 960 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS07160027.wiff

**Date Analyzed:** 16-JUL-14 18:19

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 3.73 | | 0.313 | 1.04 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 3058-38-6 | TATB | 3.75 | | 0.313 | 1.04 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 3.89 | | 0.313 | 1.04 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 4.18 | | 0.521 | 2.60 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.55 | | 0.521 | 2.60 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460(351059004MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114641

**Sample Amount** 925 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0714045.wiff

**Date Analyzed:** 15-JUL-14 13:09

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 2.83 | | 0.0865 | 0.541 |
| *479-45-8* | *Tetryl* | | | | |
| 98-95-3 | Nitrobenzene | 4.28 | | 0.0865 | 0.270 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.3 | | 0.0865 | 0.270 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.39 | | 0.0886 | 0.270 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 99-99-0 | p-Nitrotoluene | 4.61 | | 0.162 | 0.541 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.64 | | 0.0865 | 0.270 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 78-11-5 | PETN | 4.68 | | 0.108 | 0.541 |
| *78-11-5* | *PETN* | | | | |
| 2691-41-0 | HMX | 4.69 | | 0.0865 | 0.270 |
| *2691-41-0* | *HMX* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.75 | | 0.0865 | 0.270 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.82 | | 0.0865 | 0.270 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.84 | | 0.0865 | 0.270 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-82-4 | RDX | 4.84 | | 0.0865 | 0.270 |
| *121-82-4* | *RDX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 5.09 | | 0.0865 | 0.270 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460(351059004MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114641

**Sample Amount** 925 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 5.54 | | 0.0865 | 0.270 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.54 | | 0.0865 | 0.270 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CALA-14-79460(351059004MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-3584

**Matrix:** WATER

**GEL Sample ID:** 1203114641

**Sample Amount** 925 mL

**Date Received:** 20-JUN-14

**Moisture:**

**Extraction Batch ID:** 1398120

**Extraction Type** Sol Exchange

**Date Extracted:** 24-JUN-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS07160028.wiff

**Date Analyzed:** 16-JUL-14 18:35

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 3.58 | | 0.324 | 1.08 |
| *3058-38-6* | *TATB* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 3.81 | | 0.324 | 1.08 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 4.05 | | 0.324 | 1.08 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 4.26 | | 0.541 | 2.70 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.57 | | 0.541 | 2.70 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 14-JUL-14 11:32

**GEL Data File:** EXP0714001.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 14-JUL-14 12:07

**GEL Data File:** EXP0714002.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 16-JUL-14 11:04

**GEL Data File:** EXS07160001.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 16-JUL-14 11:21

**GEL Data File:** EXS07160002.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 14-JUL-14 16:11

**GEL Data File:** EXP0714009.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| PETN | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 14-JUL-14 17:21

**GEL Data File:** EXP0714011.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 14-JUL-14 20:51

**GEL Data File:** EXP0714017.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 15-JUL-14 00:21

**GEL Data File:** EXP0714023.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK06

**Analysis Date:** 15-JUL-14 02:40

**GEL Data File:** EXP0714027.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 15-JUL-14 06:45

**GEL Data File:** EXP0714034.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK08

**Analysis Date:** 15-JUL-14 07:55

**GEL Data File:** EXP0714036.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK09

**Analysis Date:** 15-JUL-14 10:14

**GEL Data File:** EXP0714040.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK10

**Analysis Date:** 15-JUL-14 13:44

**GEL Data File:** EXP0714046.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK11

**Analysis Date:** 15-JUL-14 14:54

**GEL Data File:** EXP0714048.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 16-JUL-14 13:34

**GEL Data File:** EXS07160010.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 6.96 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.31 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 16-JUL-14 14:08

**GEL Data File:** EXS07160012.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 3.3 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 16-JUL-14 16:55

**GEL Data File:** EXS07160022.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 2.89 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-3584

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 16-JUL-14 19:09

**GEL Data File:** EXS07160030.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 3.07 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 18-JUL-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LC-MS/MS | SW846 3535/8321A Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1398124 | See Below | | |

**Potentially affected work order(s)(SDG): 351059(2014-3584)**

**Application Issues:**

Failed Recovery for LCS/LCSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The LCS (1203114639) did not meet acceptance criteria for the recovery of Tetryl at 43.6%. The limits are 65-120%. | 1. Both the MS (1203114640) and MSD (1203114641) met acceptance criteria for all target analytes. The data are reported with the appropriate DER. |

**Originator's Name:**

Lynne Russell 18-JUL-14

**Data Validator/Group Leader:**

Michael Penny 18-JUL-14

# Pesticide Analysis

# Case Narrative

**PCB Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Organochlorine Pesticides and Chlorinated Hydrocarbons** |
| Analytical Method: | SW846 3535A/8081B |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1400058 1398217 |
| Prep Batch Number: | 1398216 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8011:

| Sample ID | Client ID |
|---|---|
| 351059001 | CALA-14-79460 |
| 351059006 | CALA-14-79460 |
| 1203114814 | Method Blank (MB) |
| 1203114815 | Laboratory Control Sample (LCS) |
| 1203114816 | 351059006(CALA-14-79460) Matrix Spike (MS) |
| 1203114818 | Laboratory Control Sample Duplicate (LCSD) |
| 1203119631 | Method Blank (MB) |
| 1203119632 | Laboratory Control Sample (LCS) |
| 1203119633 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-041 REV# 13 and GL-OA-E-059 REV# 12.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard

Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for this analytical batch for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The laboratory control sample (LCS) spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD values between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 351059006 (CALA-14-79460)- Batch 1398217 was selected for the matrix spike analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries for this SDG were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPD values between the MS and MSD were within the acceptance limits.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG in this analytical batch met the specified holding time.

**Sample preservation**
All samples in this batch met preservation and integrity requirements.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

**Sample Dilutions**
The samples in this SDG in this analytical batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Florisil**
Florisil clean-up was not performed on client and quality control samples in this batch. Batch 1398217.

**Miscellaneous Information**

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction. Batch 1400058 and Batch 1398217.

**Additional Comments**
The front column is reported. Batch 1400058. The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Detected target analytes were reported from the analytical column with the lower concentration. Results below the method detection limit (non-detects) were reported from column one.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate recovery acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10). Batch 1398217.

**System Configuration**

The Semi-Volatiles-Pesticide analysis was performed on the following instrument configuration:

The 504.1/8011 analysis of EDB/DBCP was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD7A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7673 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide I) |
| ECD7A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7673 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-50-504/8011 | 30m x 0.53mm, 1.00um |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-XLB-504/8 | 30m x 0.53mm, 1.50um |

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

E  Concentration of the target analyte exceeds the instrument calibration range

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Cameron Bearden  **Name: Cameron Bearden**

**Date: 16 JUL 2014**  **Title: Group Leader**

# Sample Data Summary

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059001** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1400058** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **07/02/2014 22:40** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **07/02/2014 15:24** | **Aliquot:** | **35.25 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **070214HE\E1g0218.D** | **Column:** | **1 ZB-50** | | |
| | **070214HE\E1g0218.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0199 | ug/L | 0.00596 | 0.0199 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0199 | ug/L | 0.00596 | 0.0199 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.62 | 3.55 | ug/L | 102 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059006** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 18:41** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **980 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2420.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2420.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | U | 0.0204 | ug/L | 0.00638 | 0.0204 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.811 | 1.02 | ug/L | 79.5 | (36%-106%) |
| Decachlorobiphenyl | 0.965 | 1.02 | ug/L | 94.5 | (41%-124%) |

# Quality Control Summary

**Pesticide**

## Surrogate Recovery Report

**SDG Number: 2014-3584**

**Matrix Type: LIQUID**

| Sample ID | Client ID | BFB 1 %REC # | BFB 2 %REC # |
|---|---|---|---|
| 1203119631 | MB for batch 1400057 | 102 | 101 |
| 1203119632 | LCS for batch 1400057 | 107 | 120 |
| 1203119633 | LCSD for batch 1400057 | 105 | 116 |
| 351059001 | CALA-14-79460 | 102 | 101 |

| Surrogate | Acceptance Limits |
|---|---|
| BFB = Bromofluorobenzene | (73%-135%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Pesticide**

## Surrogate Recovery Report

**SDG Number: 2014-3584**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|---|---|---|---|---|---|
| 1203114814 | MB for batch 1398216 | 83 | 81 | 98 | 100 |
| 1203114815 | LCS for batch 1398216 | 81 | 79 | 91 | 94 |
| 1203114818 | LCSD for batch 1398216 | 73 | 71 | 89 | 90 |
| 351059006 | CALA-14-79460 | 84 | 80 | 99 | 95 |
| 1203114816 | CALA-14-79460MS | 76 | 74 | 84 | 83 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 4CMX | = 4cmx | (36%-106%) |
| DCB | = Decachlorobiphenyl | (41%-124%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1398216**
**Lab Sample ID** **1203114815**
**Instrument:** **ECD7A.I**
**Analyst:** **LOF**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/24/2014 17:20**
**Dilution: 1**
**Prep Batch ID:** **1398216**
**Batch ID:** **1398217**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 118-74-1 | LCS | Hexachlorobenzene | 0.100 | 0.0 | 0.0728 | 73 | 50-150 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCSD for batch 1398216**
**Lab Sample ID** **1203114818**
**Instrument:** **ECD7A.I**
**Analyst:** **LOF**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **06/24/2014 17:36**
**Dilution: 1**
**Prep Batch ID:** **1398216**
**Batch ID:** **1398217**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 118-74-1 | LCSD Hexachlorobenzene | 0.100 | 0.0 | 0.0674 | 67 | 50-150 | 8 | 0-30 |

**Pesticide**

## Quality Control Summary
## Spike Recovery Report

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203114816**
**Instrument:** **ECD7A.I**
**Analyst:** **LOF**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/24/2014 18:57**
**Prep Batch ID:** **1398216**
**Batch ID:** **1398217**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 118-74-1 | MS | Hexachlorobenzene | 0.104 | 0.00 | U | 0.0821 | 79 | 50-150 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1400057**
**Lab Sample ID** **1203119632**
**Instrument:** **ECD1A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **07/02/2014 21:58**
**Prep Batch ID:** **1400057**
**Batch ID:** **1400058**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-93-4 | LCS | 1,2-Dibromoethane | 0.200 | 0.0 | 0.184 | 92 | 70-130 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.191 | 96 | 70-130 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCSD for batch 1400057**
**Lab Sample ID** **1203119633**
**Instrument:** **ECD1A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **07/02/2014 22:19**
**Dilution: 1**
**Prep Batch ID:** **1400057**
**Batch ID:** **1400058**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-93-4 | LCSD 1,2-Dibromoethane | 0.200 | 0.0 | 0.190 | 95 | 70-130 | 3 | 0-20 |
| 96-12-8 | LCSD 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.196 | 98 | 70-130 | 2 | 0-20 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1398216** | **Instrument ID:** | **ECD7A.I_1**<br>**ECD7A.I_2** | **Data File:** | **062414.B\e7f2414.D**<br>**062414.B\e7f2414.D** |
| **Lab Sample ID:** | **1203114814** | | | | |
| **Column:** | **CLPesticides**<br>**CLPesticides2** | **Prep Date:** | **06/24/2014 06:30** | **Analyzed:** | **06/24/14 17:04** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1398216** | **1203114815** | **062414.B\e7f2415.D**<br>**062414.B\e7f2415.D** | **06/24/14** | **1720** |
| **02 LCSD for batch 1398216** | **1203114818** | **062414.B\e7f2416.D**<br>**062414.B\e7f2416.D** | **06/24/14** | **1736** |
| **03 CALA-14-79460** | **351059006** | **062414.B\e7f2420.D**<br>**062414.B\e7f2420.D** | **06/24/14** | **1841** |
| **04 CALA-14-79460MS** | **1203114816** | **062414.B\e7f2421.D**<br>**062414.B\e7f2421.D** | **06/24/14** | **1857** |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1400057** | **Instrument ID:** | **ECD1A.I_1**<br>**ECD1A.I_2** | **Data File:** | **070214HE\E1g0215.D**<br>**070214HE\E1g0215.D** |
| **Lab Sample ID:** | **1203119631** | | | | |
| **Column:** | **ZB-50**<br>**ZB-XLB** | **Prep Date:** | **07/02/2014 14:45** | **Analyzed:** | **07/02/14 21:37** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1400057** | **1203119632** | **070214HE\E1g0216.D**<br>**070214HE\E1g0216.D** | **07/02/14** | **2158** |
| **02 LCSD for batch 1400057** | **1203119633** | **070214HE\E1g0217.D**<br>**070214HE\E1g0217.D** | **07/02/14** | **2219** |
| **03 CALA-14-79460** | **351059001** | **070214HE\E1g0218.D**<br>**070214HE\E1g0218.D** | **07/02/14** | **2240** |

# Quality Control Data

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114814** | | | | |
| **Client Sample:** | **QC for batch 1398216** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398216** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:04** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2414.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2414.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | U | 0.020 | ug/L | 0.00625 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.979 | 1.00 | ug/L | 97.9 | (41%-124%) |
| 4cmx | 0.808 | 1.00 | ug/L | 80.8 | (36%-106%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114815** | | | | |
| **Client Sample:** | **QC for batch 1398216** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398216** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:20** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2415.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2415.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | | 0.0728 | ug/L | 0.00625 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.914 | 1.00 | ug/L | 91.4 | (41%-124%) |
| 4cmx | 0.788 | 1.00 | ug/L | 78.8 | (36%-106%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203114816** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398216** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 18:57** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **960 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2421.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2421.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | | 0.0821 | ug/L | 0.00651 | 0.0208 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.770 | 1.04 | ug/L | 73.9 | (36%-106%) |
| Decachlorobiphenyl | 0.870 | 1.04 | ug/L | 83.5 | (41%-124%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203114818** | | | | |
| **Client Sample:** | **QC for batch 1398216** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1398216** | **Method:** | **SW846 3535A/8081B** | **SOP Ref:** | **GL-OA-E-041** |
| **Batch ID:** | **1398217** | **Inst:** | **ECD7A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:36** | **Analyst:** | **LOF** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **5 mL** |
| **Data File:** | **062414.B\e7f2416.D** | **Column:** | **1 CLPesticides** | | |
| | **062414.B\e7f2416.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 118-74-1 | Hexachlorobenzene | | 0.0674 | ug/L | 0.00625 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.892 | 1.00 | ug/L | 89.2 | (41%-124%) |
| 4cmx | 0.715 | 1.00 | ug/L | 71.5 | (36%-106%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119631** | | | | |
| **Client Sample:** | **QC for batch 1400057** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1400057** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1400058** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **07/02/2014 21:37** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **07/02/2014 14:45** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **070214HE\E1g0215.D** | **Column:** | **1 ZB-50** | | |
| | **070214HE\E1g0215.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.65 | 3.57 | ug/L | 102 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119632** | | | | |
| **Client Sample:** | **QC for batch 1400057** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1400057** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1400058** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **07/02/2014 21:58** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **07/02/2014 14:45** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **070214HE\E1g0216.D** | **Column:** | **1 ZB-50** | | |
| | **070214HE\E1g0216.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.191 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.184 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.82 | 3.57 | ug/L | 107 | (73%-135%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203119633** | | | | |
| **Client Sample:** | **QC for batch 1400057** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1400057** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1400058** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **07/02/2014 22:19** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **07/02/2014 14:45** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **070214HE\E1g0217.D** | **Column:** | **1 ZB-50** | | |
| | **070214HE\E1g0217.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.196 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.190 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.74 | 3.57 | ug/L | 105 | (73%-135%) |

# PCB Analysis

# Case Narrative

**PCB Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Polychlorinated Biphenyls by ECD** |
| Analytical Method: | SW846 3535A/8082 |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1398308 |
| Prep Batch Number: | 1398306 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

| Sample ID | Client ID |
|---|---|
| 351059002 | CALA-14-79460 |
| 1203115033 | Method Blank (MB) |
| 1203115034 | Laboratory Control Sample (LCS) |
| 1203115035 | 351059002(CALA-14-79460) Matrix Spike (MS) |
| 1203115041 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria; however, the MB was contaminated with low level (below the PQL) of Aroclor-1248 and Aroclor-1254.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 351059002 (CALA-14-79460) was selected for the matrix spike analysis. The matrix spike duplicate analysis was not performed for this batch of the samples due to limited sample volume. The LCS and LCSD analysis was performed to measure the precision and accuracy for the batch.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina. Additionally, copper was added to all sample extracts to remove sulfur.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this batch.

## Miscellaneous Information

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. DER #1308637 was generated for this SDG.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the LCSD are from the same analytical column as the LCS. The data reported for the MS are from the same analytical column as the parent sample.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

**System Configuration**

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD8A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide I) |
| ECD8A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Jimin Cao  **Name: Jimin Cao**

**Date: 10 JUL 2014**  **Title: Data Validator**

# Sample Data Summary

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059002** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1398308** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 09:01** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/25/2014 07:50** | **Aliquot:** | **970 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062614.B\e8f2615.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **062614.B\e8f2615.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.151 | 0.206 | ug/L | 73.3 | (45%-120%) |
| Decachlorobiphenyl | 0.185 | 0.206 | ug/L | 89.6 | (45%-120%) |

# Quality Control Summary

**PCB**

## Surrogate Recovery Report

**SDG Number: 2014-3584**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|---|---|---|---|---|---|
| 1203115033 | MB for batch 1398306 | 70 | 73 | 79 | 89 |
| 1203115034 | LCS for batch 1398306 | 76 | 78 | 90 | 100 |
| 1203115041 | LCSD for batch 1398306 | 74 | 77 | 85 | 95 |
| 351059002 | CALA-14-79460 | 70 | 73 | 80 | 90 |
| 1203115035 | CALA-14-79460MS | 77 | 81 | 67 | 98 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 4CMX | = 4cmx | (45%-120%) |
| DCB | = Decachlorobiphenyl | (45%-120%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1398306**
**Lab Sample ID** **1203115034**
**Instrument:** **ECD8A.I**
**Analyst:** **JXM**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/26/2014 08:36**
**Dilution: 1**
**Prep Batch ID:** **1398306**
**Batch ID:** **1398308**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCS | Aroclor-1016 | 1.00 | 0.0 | 0.798 | 80 | 48-109 |
| 11096-82-5 | LCS | Aroclor-1260 | 1.00 | 0.0 | 0.849 | 85 | 54-111 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCSD for batch 1398306**
**Lab Sample ID** **1203115041**
**Instrument:** **ECD8A.I**
**Analyst:** **JXM**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **06/26/2014 08:48**
**Dilution: 1**
**Prep Batch ID:** **1398306**
**Batch ID:** **1398308**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCSD Aroclor-1016 | 1.00 | 0.0 | 0.816 | 82 | 48-109 | 2 | 0-30 |
| 11096-82-5 | LCSD Aroclor-1260 | 1.00 | 0.0 | 0.836 | 84 | 54-111 | 2 | 0-30 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79460MS**
**Lab Sample ID** **1203115035**
**Instrument:** **ECD8A.I**
**Analyst:** **JXM**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/26/2014 09:13**
**Prep Batch ID:** **1398306**
**Batch ID:** **1398308**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MS | Aroclor-1016 | 1.03 | 0.00 | U | 0.818 | 79 | 40-104 |
| 11096-82-5 | MS | Aroclor-1260 | 1.03 | 0.00 | U | 0.914 | 89 | 42-112 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1398306** | **Instrument ID:** | **ECD8A.I_1**<br>**ECD8A.I_2** | **Data File:** | **062614.B\e8f2612.D**<br>**062614.B\e8f2612.D** |
| **Lab Sample ID:** | **1203115033** | | | | |
| **Column:** | **RTX-CLPEST1**<br>**RTX-CLPEST2** | **Prep Date:** | **06/25/2014 07:50** | **Analyzed:** | **06/26/14 08:24** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1398306** | **1203115034** | **062614.B\e8f2613.D**<br>**062614.B\e8f2613.D** | **06/26/14** | **0836** |
| **02 LCSD for batch 1398306** | **1203115041** | **062614.B\e8f2614.D**<br>**062614.B\e8f2614.D** | **06/26/14** | **0848** |
| **03 CALA-14-79460** | **351059002** | **062614.B\e8f2615.D**<br>**062614.B\e8f2615.D** | **06/26/14** | **0901** |
| **04 CALA-14-79460MS** | **1203115035** | **062614.B\e8f2616.D**<br>**062614.B\e8f2616.D** | **06/26/14** | **0913** |

# Quality Control Data

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203115033** | | | | |
| **Client Sample:** | **QC for batch 1398306** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1398306** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1398308** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 08:24** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/25/2014 07:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062614.B\e8f2612.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **062614.B\e8f2612.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | J | 0.0874 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | J | 0.0498 | ug/L | 0.0333 | 0.100 | 2 |
| 11096-82-5 | Aroclor-1260 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.146 | 0.200 | ug/L | 73.2 | (45%-120%) |
| Decachlorobiphenyl | 0.177 | 0.200 | ug/L | 88.7 | (45%-120%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203115034** | | | | |
| **Client Sample:** | **QC for batch 1398306** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1398306** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1398308** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 08:36** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/25/2014 07:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062614.B\e8f2613.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **062614.B\e8f2613.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.798 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.849 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.157 | 0.200 | ug/L | 78.5 | (45%-120%) |
| Decachlorobiphenyl | 0.201 | 0.200 | ug/L | 100 | (45%-120%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203115035** | **Date Received:** | **06/20/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1398306** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79460MS** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1398308** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 09:13** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/25/2014 07:50** | **Aliquot:** | **970 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062614.B\e8f2616.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **062614.B\e8f2616.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.818 | ug/L | 0.0343 | 0.103 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.914 | ug/L | 0.0343 | 0.103 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.103 | ug/L | 0.0343 | 0.103 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.166 | 0.206 | ug/L | 80.6 | (45%-120%) |
| Decachlorobiphenyl | 0.203 | 0.206 | ug/L | 98.5 | (45%-120%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203115041** | | | | |
| **Client Sample:** | **QC for batch 1398306** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1398306** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1398308** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/26/2014 08:48** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/25/2014 07:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **062614.B\e8f2614.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **062614.B\e8f2614.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.816 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.836 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.154 | 0.200 | ug/L | 77.1 | (45%-120%) |
| Decachlorobiphenyl | 0.190 | 0.200 | ug/L | 95.2 | (45%-120%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 26-JUN-14 | Federal | SOP | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| GC/ECD | SW846 3535A/8082 | Liquid | ARSL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1398308 | 1203115033 | | |

**Potentially affected work order(s)(SDG): 351059(2014-3584)**

**Application Issues:**

Method Blank contamination

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| The Method Blank was contaminated with low level (below the PQL) of Aroclor-1248 and Aroclor-1254. | This non-compliance had no adverse effects on the data as the detection in the MB was below the PQL and the ARSL sample in this batch was not detected with any of the Aroclors. The data were reported. |

**Originator's Name:**

James Maestas 26-JUN-14

**Data Validator/Group Leader:**

Jimin Cao 10-JUL-14

# Herbicide Analysis

# Case Narrative

**Herbicide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Chlorophenoxy Acid Herbicides by ECD** |
| Analytical Method: | SW846 8151A |
| Prep Method: | SW846 8151A |
| Analytical Batch Number: | 1397789 |
| Prep Batch Number: | 1397787 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8151A:

| Sample ID | Client ID |
|---|---|
| 351059007 | CALA-14-79460 |
| 1203113792 | Method Blank (MB) |
| 1203113793 | 350951007(CALA-14-79458) Matrix Spike (MS) |
| 1203113794 | Laboratory Control Sample (LCS) |
| 1203113795 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-011 REV# 21.

Raw data reports are processed and reviewed by the analyst using ChemStation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All Initial Calibration Verification (ICV) requirements have been met for this SDG. However, not all Calibration Verification Standards (CCV) requirements were met. Pentachlorophenol failed acceptance criteria with a positive bias on one analytical column in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. Since the target analyte was not detected in the samples, the non-compliance had no adverse impact on the data. All analytes were within the established retention time windows for this method.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD(s) between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 350951007 (CALA-14-79458) was selected for analysis as the matrix spike. A matrix spike duplicate was not extracted or analyzed with this batch. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
There was no matrix spike duplicate extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**MS/MSD Relative Percent Difference (RPD) Statement**
There are no reportable MS/MSD RDP values since a MSD was not extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported target analyte concentrations were confirmed on a dissimilar column.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

## Miscellaneous Information

### Electronic Package Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### Data Exception (DER) Documentation

Data Exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A Data Exception Report (DER) was not required for this SDG.

### Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this Herbicide fraction.

### Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS are from the same analytical column as the parent sample. The data reported for the LCSD are from the same analytical column as the LCS. The container scanning event for custody was missed for sample 351059007 (CALA-14-79460). The laboratory maintained custody of the samples throughout the analysis process.

Due to rounding differences in the calculation between the forms, the data reported in the Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

## System Configuration

The Semi-Volatiles-HERB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD3A.I_1 | Agilent 7890A GC with duel uECD | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD3A.I_2 | Agilent 7890A GC with duel uECD | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticideII) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 17 JUL 2014**  **Title: Data Validator**

# Sample Data Summary

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/18/2014 09:53** | **Matrix:** | **W** |
| **Lab Sample ID:** | **351059007** | **Date Received:** | **06/20/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CALA-14-79460** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 21:00** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **950 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2418.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2418.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.263 | ug/L | 0.0526 | 0.263 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.71 | 5.26 | ug/L | 109 | (43%-137%) |

# Quality Control Summary

**Herbicide**

## Surrogate Recovery Report

**SDG Number: 2014-3584**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCAA 1 %REC # | DCAA 2 %REC # |
|---|---|---|---|
| 1203113792 | MB for batch 1397787 | 83 | 93 |
| 1203113794 | LCS for batch 1397787 | 91 | 92 |
| 1203113795 | LCSD for batch 1397789 | 92 | 92 |
| 1203113793 | CALA-14-79458MS | 98 | 91 |
| 351059007 | CALA-14-79460 | 104 | 109 |

| Surrogate | Acceptance Limits |
|---|---|
| DCAA = 2,4-Dichlorophenylacetic acid | (43%-137%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **CALA-14-79458MS**
**Lab Sample ID** **1203113793**
**Instrument:** **ECD3A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **06/24/2014 19:21**
**Prep Batch ID:** **1397787**
**Batch ID:** **1397789**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | MS | Pentachlorophenol | 2.17 | 0.00 | U | 1.89 | 87 | 37-114 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCS for batch 1397787**
**Lab Sample ID** **1203113794**
**Instrument:** **ECD3A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **06/24/2014 17:03**
**Dilution: 1**
**Prep Batch ID:** **1397787**
**Batch ID:** **1397789**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 87-86-5 | LCS | Pentachlorophenol | 2.00 | 0.0 | 1.90 | 95 | 55-113 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3584**
**Client ID:** **LCSD for batch 1397789**
**Lab Sample ID** **1203113795**
**Instrument:** **ECD3A.I**
**Analyst:** **RXE1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **06/24/2014 17:27**
**Dilution: 1**
**Prep Batch ID:** **1397787**
**Batch ID:** **1397789**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | LCSD Pentachlorophenol | 2.00 | 0.0 | 1.94 | 97 | 55-113 | 2 | 0-30 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1397787** | **Instrument ID:** | **ECD3A.I_1**<br>**ECD3A.I_2** | **Data File:** | **062414.B\e3f2407.D**<br>**062414.B\e3f2407.D** |
| **Lab Sample ID:** | **1203113792** | | | | |
| **Column:** | **RTX-CLPEST 1**<br>**RTX-CLPEST 2** | **Prep Date:** | **06/24/2014 06:50** | **Analyzed:** | **06/24/14 16:38** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1397787** | **1203113794** | **062414.B\e3f2408.D**<br>**062414.B\e3f2408.D** | **06/24/14** | **1703** |
| **02 LCSD for batch 1397789** | **1203113795** | **062414.B\e3f2409.D**<br>**062414.B\e3f2409.D** | **06/24/14** | **1727** |
| **03 CALA-14-79458MS** | **1203113793** | **062414.B\e3f2414.D**<br>**062414.B\e3f2414.D** | **06/24/14** | **1921** |
| **04 CALA-14-79460** | **351059007** | **062414.B\e3f2418.D**<br>**062414.B\e3f2418.D** | **06/24/14** | **2100** |

# Quality Control Data

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203113792** | | | | |
| **Client Sample:** | **QC for batch 1397787** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1397787** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 16:38** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2407.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2407.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.250 | ug/L | 0.050 | 0.250 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.63 | 5.00 | ug/L | 92.6 | (43%-137%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | **Date Collected:** | **06/17/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203113793** | **Date Received:** | **06/19/2014 08:50** | | |
| **Client Sample:** | **QC for batch 1397787** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CALA-14-79458MS** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 19:21** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **920 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2414.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2414.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.89 | ug/L | 0.0543 | 0.272 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.95 | 5.43 | ug/L | 91.1 | (43%-137%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203113794** | | | | |
| **Client Sample:** | **QC for batch 1397787** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1397787** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:03** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2408.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2408.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.90 | ug/L | 0.050 | 0.250 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.61 | 5.00 | ug/L | 92.3 | (43%-137%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3584** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203113795** | | | | |
| **Client Sample:** | **QC for batch 1397787** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1397789** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1397789** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **06/24/2014 17:27** | **Analyst:** | **RXE1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **06/24/2014 06:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **062414.B\e3f2409.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **062414.B\e3f2409.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.94 | ug/L | 0.050 | 0.250 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.60 | 5.00 | ug/L | 92.0 | (43%-137%) |

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

**Sample Analysis**

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 351059008 | CALA-14-79466 |
| 1203113666 | Method Blank (MB) **ICP** |
| 1203113667 | Laboratory Control Sample (LCS) |
| 1203113670 | 351059008(CALA-14-79466L) Serial Dilution (SD) |
| 1203113668 | 351059008(CALA-14-79466D) Sample Duplicate (DUP) |
| 1203113669 | 351059008(CALA-14-79466S) Matrix Spike (MS) |
| 1203113620 | Method Blank (MB) **ICP-MS** |
| 1203113621 | Laboratory Control Sample (LCS) |
| 1203113624 | 351059008(CALA-14-79466L) Serial Dilution (SD) |
| 1203113622 | 351059008(CALA-14-79466D) Sample Duplicate (DUP) |
| 1203113623 | 351059008(CALA-14-79466S) Matrix Spike (MS) |
| 1203115078 | Method Blank (MB) **CVAA** |
| 1203115079 | Laboratory Control Sample (LCS) |
| 1203115082 | 351059005(CALA-14-79460L) Serial Dilution (SD) |
| 1203115080 | 351059005(CALA-14-79460D) Sample Duplicate (DUP) |
| 1203115081 | 351059005(CALA-14-79460S) Matrix Spike (MS) |

**Method/Analysis Information**

| | |
|---|---|
| **Analytical Batch:** | 1397744, 1397720, 1398324 and 1404141 |
| **Prep Batch :** | 1397743, 1397719 and 1398323 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 10, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 27 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**System Configuration**

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

**Calibration Information**

**Instrument Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL/PQL Requirements**
All PQL standards for 6010C met the control limits with the exception of sodium and zinc listed below. The sample concentrations were less than the MDL or greater than 2x the PQL, so the data is not adversely affected. 351059008 (CALA-14-79466)-ICP.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blanks (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 351059008 (CALA-14-79466)-ICP and ICP-MS and 351059005 (CALA-14-79460)-CVAA.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Sample required dilution for tin in order to minimize suppression due to matrix interferences. 351059008 (CALA-14-79466)-ICP.

**Preparation Information**
The samples in this SDG were prepared exactly according to the cited SOP.

## Miscellaneous Information

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

**Additional Comments**
Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:** Nik-Cole A. Elmore **Date:** 7-17-14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by Nik-Cole A. Elmore 7-17-14

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3584 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 351059005 **BASIS:** As Received **DATE COLLECTED** 18−JUN−14

**CLIENT ID:** CALA−14−79460 **LEVEL:** Low **DATE RECEIVED** 20−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 06/25/14 15:53 | 062514W2−4 | 1398324 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1398324 | 1398323 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 06/24/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3584 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 351059008 **BASIS:** As Received **DATE COLLECTED** 18−JUN−14

**CLIENT ID:** CALA−14−79466 **LEVEL:** Low **DATE RECEIVED** 20−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 06/25/14 16:02 | 062514W2−4 | 1398324 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−3584 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 351059008 **BASIS:** As Received **DATE COLLECTED** 18−JUN−14

**CLIENT ID:** CALA−14−79466 **LEVEL:** Low **DATE RECEIVED** 20−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7440−38−2 | Arsenic | 1.81 | ug/L | J | 1.7 | 5 | 5 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7440−39−3 | Barium | 42.6 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−42−8 | Boron | 23.4 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7440−70−2 | Calcium | 27600 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−47−3 | Chromium | 10 | ug/L | U | 2 | 10 | 10 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7439−95−4 | Magnesium | 7750 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7439−98−7 | Molybdenum | 2.33 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7440−02−0 | Nickel | 0.604 | ug/L | J | 0.5 | 2 | 2 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7440−09−7 | Potassium | 4490 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7631−86−9 | Silica | 40200 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7440−23−5 | Sodium | 14400 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−24−6 | Strontium | 127 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 07/17/14 05:32 | 140716−2 | 1397720 |
| 7440−31−5 | Tin | 100 | ug/L | U | 25 | 100 | 100 | 10 | P | HSC | 06/27/14 21:09 | 062714A−1 | 1397744 |
| 7440−61−1 | Uranium | 1.98 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 07/17/14 09:08 | 140716−3 | 1397720 |
| 7440−62−2 | Vanadium | 6.94 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 06/27/14 20:57 | 062714A−1 | 1397744 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3584 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 351059008 **BASIS:** As Received **DATE COLLECTED** 18−JUN−14

**CLIENT ID:** CALA−14−79466 **LEVEL:** Low **DATE RECEIVED** 20−JUN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 101 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | BCD1 | 07/17/14 11:27 | | 1404141 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1397720 | 1397719 | SW846 3005A | 50 | mL | 50 | mL | 06/24/14 | JXM5 |
| 1397744 | 1397743 | SW846 3005A | 50 | mL | 50 | mL | 06/24/14 | JXM5 |
| 1398324 | 1398323 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 06/24/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2014−3584

**Contract:** ESHL00714

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203113620 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203113666 | | | | | | | | |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 50 | ug/L | +/−150 | U | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 127 | ug/L | +/−300 | J | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| 1203115078 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3584 **Client ID** CALA−14−79466S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 351059008 **Spike ID:** 1203113623

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | 75−125 | 50.6 | | 1 | U | 50 | 101 | | MS |
| Arsenic | ug/L | 75−125 | 51.5 | | 1.81 | J | 50 | 99.3 | | MS |
| Cadmium | ug/L | 75−125 | 50.9 | | 0.11 | U | 50 | 102 | | MS |
| Chromium | ug/L | 75−125 | 51.6 | | 2 | U | 50 | 99.2 | | MS |
| Lead | ug/L | 75−125 | 49.4 | | 0.5 | U | 50 | 98.7 | | MS |
| Molybdenum | ug/L | 75−125 | 57.1 | | 2.33 | | 50 | 110 | | MS |
| Nickel | ug/L | 75−125 | 48.6 | | 0.604 | J | 50 | 95.9 | | MS |
| Selenium | ug/L | 75−125 | 51.7 | | 1.5 | U | 50 | 101 | | MS |
| Silver | ug/L | 75−125 | 52.4 | | 0.2 | U | 50 | 105 | | MS |
| Thallium | ug/L | 75−125 | 47.8 | | 0.45 | U | 50 | 95.4 | | MS |
| Uranium | ug/L | 75−125 | 54.5 | | 1.98 | | 50 | 105 | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3584 **Client ID** CALA−14−79466S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 351059008 **Spike ID:** 1203113669

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 4870 | | 68 | U | 5000 | 97 | | P |
| Barium | ug/L | 75−125 | 543 | | 42.6 | | 500 | 100 | | P |
| Beryllium | ug/L | 75−125 | 497 | | 1 | U | 500 | 99.4 | | P |
| Boron | ug/L | 75−125 | 510 | | 23.4 | J | 500 | 97.3 | | P |
| Calcium | ug/L | | 33300 | | 27600 | | 5000 | 113 | N/A | P |
| Cobalt | ug/L | 75−125 | 483 | | 1 | U | 500 | 96.6 | | P |
| Copper | ug/L | 75−125 | 489 | | 3 | U | 500 | 97.6 | | P |
| Iron | ug/L | 75−125 | 5160 | | 30 | U | 5000 | 103 | | P |
| Magnesium | ug/L | 75−125 | 13100 | | 7750 | | 5000 | 108 | | P |
| Manganese | ug/L | 75−125 | 492 | | 2 | U | 500 | 98.4 | | P |
| Potassium | ug/L | 75−125 | 9430 | | 4490 | | 5000 | 98.9 | | P |
| Sodium | ug/L | 75−125 | 19700 | | 14400 | | 5000 | 107 | | P |
| Strontium | ug/L | 75−125 | 615 | | 127 | | 500 | 97.6 | | P |
| Tin | ug/L | 75−125 | 472 | | 25 | U | 500 | 94.4 | | P |
| Vanadium | ug/L | 75−125 | 526 | | 6.94 | | 500 | 104 | | P |
| Zinc | ug/L | 75−125 | 487 | | 3.3 | U | 500 | 97.4 | | P |
| Silica | ug/L | 75−125 | 50600 | | 40200 | | 10700 | 97.6 | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3584 **Client ID** CALA−14−79460S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 351059005 **Spike ID:** 1203115081

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 1.76 | | 0.067 | U | 2 | 87.8 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3584 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CALA−14−79466D

**Matrix:** WATER **Level:** Low

**Sample ID:** 351059008 **Duplicate ID:** 1203113622 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | | 1.81 | J | 1.7 | U | 200 | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | | 2 | U | 2 | U | | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 2.33 | | 2.21 | | 5.06 | | MS |
| Nickel | ug/L | +/−2 | 0.604 | J | 0.657 | J | 8.41 | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−20% | 1.98 | | 2.03 | | 2.69 | | MS |

***Analytical Methods:**

**MS SW846 3005A/6020A**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3584 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CALA−14−79466D

**Matrix:** WATER **Level:** Low

**Sample ID:** 351059008 **Duplicate ID:** 1203113668 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−20% | 42.6 | | 43.6 | | 2.32 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | +/−50 | 23.4 | J | 23.8 | J | 1.89 | | P |
| Calcium | ug/L | +/−20% | 27600 | | 28000 | | 1.19 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−20% | 7750 | | 7890 | | 1.77 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 4490 | | 4560 | | 1.61 | | P |
| Silica | ug/L | +/−20% | 40200 | | 41000 | | 2.2 | | P |
| Sodium | ug/L | +/−20% | 14400 | | 14500 | | .465 | | P |
| Strontium | ug/L | +/−20% | 127 | | 128 | | 1.05 | | P |
| Tin | ug/L | | 25 | U | 25 | U | | | P |
| Vanadium | ug/L | +/−5 | 6.94 | | 6.87 | | .968 | | P |
| Zinc | ug/L | | 3.3 | U | 3.3 | U | | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3584 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CALA−14−79460D

**Matrix:** WATER **Level:** Low

**Sample ID:** 351059005 **Duplicate ID:** 1203115080 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3584

**Contract:** ESHL00714

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203113621 | | | | | | | | |
| | Antimony | ug/L | 50 | 52.7 | | 105 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 50.4 | | 101 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 52.6 | | 105 | 80−120 | MS |
| | Chromium | ug/L | 50 | 53.9 | | 108 | 80−120 | MS |
| | Lead | ug/L | 50 | 51.1 | | 102 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 55.3 | | 111 | 80−120 | MS |
| | Nickel | ug/L | 50 | 51.6 | | 103 | 80−120 | MS |
| | Selenium | ug/L | 50 | 53.5 | | 107 | 80−120 | MS |
| | Silver | ug/L | 50 | 53.9 | | 108 | 80−120 | MS |
| | Thallium | ug/L | 50 | 49.6 | | 99.1 | 80−120 | MS |
| | Uranium | ug/L | 50 | 50.1 | | 100 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3584

**Contract:** ESHL00714

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203113667 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 4960 | | 99.1 | 80−120 | P |
| | Barium | ug/L | 500 | 508 | | 102 | 80−120 | P |
| | Beryllium | ug/L | 500 | 501 | | 100 | 80−120 | P |
| | Boron | ug/L | 500 | 481 | | 96.3 | 80−120 | P |
| | Calcium | ug/L | 5000 | 5230 | | 105 | 80−120 | P |
| | Cobalt | ug/L | 500 | 505 | | 101 | 80−120 | P |
| | Copper | ug/L | 500 | 487 | | 97.5 | 80−120 | P |
| | Iron | ug/L | 5000 | 5250 | | 105 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 5390 | | 108 | 80−120 | P |
| | Manganese | ug/L | 500 | 508 | | 102 | 80−120 | P |
| | Potassium | ug/L | 5000 | 5090 | | 102 | 80−120 | P |
| | Silica | ug/L | 10700 | 10200 | | 95.5 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5160 | | 103 | 80−120 | P |
| | Strontium | ug/L | 500 | 493 | | 98.7 | 80−120 | P |
| | Tin | ug/L | 500 | 530 | | 106 | 80−120 | P |
| | Vanadium | ug/L | 500 | 524 | | 105 | 80−120 | P |
| | Zinc | ug/L | 500 | 502 | | 100 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3584

**Contract:** ESHL00714

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203115079 | | | | | | | | |
| | Mercury | ug/L | 2 | 1.91 | | 95.4 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3584 **Client ID** CALA−14−79466L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 351059008 **Serial Dilution ID:** 1203113624

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 1.81 | J | 8.5 | U | 100 | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 2 | U | 10 | U | | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | 2.33 | | 2.1 | J | 9.79 | | | MS |
| Nickel | .604 | J | 2.5 | U | 100 | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | 1.98 | | 1.91 | | 3.74 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3584 **Client ID** CALA−14−79466L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 351059008 **Serial Dilution ID:** 1203113670

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 42.6 | | 43 | | .826 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 23.4 | J | 75 | U | 100 | | | P |
| Calcium | 27600 | | 27800 | | .733 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 7750 | | 7740 | | .13 | | 10 | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 4490 | | 4680 | | 4.27 | | 10 | P |
| Silica | 40200 | | 39800 | | .882 | | 10 | P |
| Sodium | 14400 | | 15000 | | 4.08 | | 10 | P |
| Strontium | 127 | | 126 | | .122 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 6.94 | | 5.76 | J | 17.1 | | | P |
| Zinc | 3.3 | U | 16.5 | U | | | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3584 **Client ID** CALA−14−79460L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 351059005 **Serial Dilution ID:** 1203115082

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1397532 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203113154 | Method Blank (MB) |
| 1203113155 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203113157 | 350951005(CALA-14-79458) Post Spike (PS) |
| 1203113159 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 350951005 (CALA-14-79458).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1397084 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1397082 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203112036 | Method Blank (MB) |
| 1203112039 | Laboratory Control Sample (LCS) |
| 1203113067 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203113068 | 350951005(CALA-14-79458) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 350951005 (CALA-14-79458).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203113068 (CALA-14-79458).

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203113067 (CALA-14-79458).

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203112039 (LCS). The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203112036 (MB), 1203112039 (LCS), 1203113067 (CALA-14-79458) and 1203113068 (CALA-14-79458).

## Miscellaneous Information

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1307560. 1203113068 (CALA-14-79458).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages

electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1398075 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203114580 | Method Blank (MB) |
| 1203114581 | 351059008(CALA-14-79466) Sample Duplicate (DUP) |
| 1203114582 | 351141010(WT_REF-13-81148) Sample Duplicate (DUP) |
| 1203114583 | 351059008(CALA-14-79466) Post Spike (PS) |
| 1203114584 | 351141010(WT_REF-13-81148) Post Spike (PS) |
| 1203114585 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 22.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 351059008 (CALA-14-79466) and 351141010 (WT_REF-13-81148).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203114584 (WT_REF-13-81148).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203114581 (CALA-14-79466), 1203114583 (CALA-14-79466) and 351059008 (CALA-14-79466).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1309538. 1203114582 (WT_REF-13-81148) and 1203114584 (WT_REF-13-81148).

**Manual Integrations**
Manual integrations were not required for the samples in this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1397518 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1397517 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203113114 | Method Blank (MB) |
| 1203113115 | 350774001(WST03-14-67206) Sample Duplicate (DUP) |
| 1203113116 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203113119 | 350774001(WST03-14-67206) Matrix Spike (MS) |
| 1203113120 | 350951008(CALA-14-79464) Matrix Spike (MS) |
| 1203113123 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 350774001 (WST03-14-67206) and 350951008 (CALA-14-79464).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1397514 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1397513 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203113090 | Method Blank (MB) |
| 1203113091 | 350748001(VS-R28-V2-79984) Sample Duplicate (DUP) |
| 1203113094 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203113096 | 350748001(VS-R28-V2-79984) Matrix Spike (MS) |
| 1203113099 | 350951005(CALA-14-79458) Matrix Spike (MS) |
| 1203113101 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 350748001 (VS-R28-V2-79984) and 350951005 (CALA-14-79458).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203113096 (VS-R28-V2-79984).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203113091 (VS-R28-V2-79984). The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203113094 (CALA-14-79458).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1307759. 1203113091 (VS-R28-V2-79984) and 1203113096 (VS-R28-V2-79984).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1397522 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203113134 | Method Blank (MB) |
| 1203113135 | 350774001(WST03-14-67206) Sample Duplicate (DUP) |
| 1203113137 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203113138 | 350774001(WST03-14-67206) Post Spike (PS) |
| 1203113140 | 350951008(CALA-14-79464) Post Spike (PS) |
| 1203113141 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 350774001 (WST03-14-67206) and 350951008 (CALA-14-79464).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203113135 (WST03-14-67206), 1203113138 (WST03-14-67206) and 351059008 (CALA-14-79466).

**Sample Re-analysis**
The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203113135 (WST03-14-67206) and 1203113138 (WST03-14-67206).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1397516 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1397515 | **Method:** | EEPA 365.4 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203113102 | Method Blank (MB) |
| 1203113103 | 350748001(VS-R28-V2-79984) Sample Duplicate (DUP) |
| 1203113104 | 350774001(WST03-14-67206) Sample Duplicate (DUP) |
| 1203113106 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203113108 | 350748001(VS-R28-V2-79984) Matrix Spike (MS) |
| 1203113109 | 350774001(WST03-14-67206) Matrix Spike (MS) |
| 1203113111 | 350951008(CALA-14-79464) Matrix Spike (MS) |
| 1203113113 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 350748001 (VS-R28-V2-79984), 350774001 (WST03-14-67206) and 350951008 (CALA-14-79464).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The sample concentration is more than four times the spike nominal concentration; therefore, the spike recovery is not applicable. 1203113109 (WST03-14-67206).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203113104 (WST03-14-67206).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203113104 (WST03-14-67206) and 1203113109 (WST03-14-67206).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1307850. 1203113104 (WST03-14-67206).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1398055 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203114531 | Method Blank (MB) |
| 1203114532 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203114536 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 350951008 (CALA-14-79464).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1400986 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203121763 | Laboratory Control Sample (LCS) |
| 1203121764 | 351059008(CALA-14-79466) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1400108 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203119756 | 350951008(CALA-14-79464) Sample Duplicate (DUP) |
| 1203119758 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a Thermo Orion Star A111. Immediates

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1311210. 351059008 (CALA-14-79466).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1400107 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 351059008 | CALA-14-79466 |
| 1203119743 | Method Blank (MB) |
| 1203119748 | 351059008(CALA-14-79466) Sample Duplicate (DUP) |
| 1203119752 | 351059008(CALA-14-79466) Matrix Spike (MS) |
| 1203119753 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 351059008 (CALA-14-79466).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____17July14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

E  Concentration of the target analyte exceeds the instrument calibration range

H  Analytical holding time was exceeded

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: July 17, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2014-3584

Client Sample ID: CALA-14-79460
Sample ID: 351059005
Matrix: W
Collect Date: 18-JUN-14 09:53
Receive Date: 20-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | J | 0.616 | 0.330 | 1.00 | mg/L | 1 | TSM | 06/21/14 | 0149 | 1397532 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 06/24/14 | 0904 | 1397084 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.110 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 06/24/14 | 1236 | 1397514 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 06/23/14 | 1102 | 1397082 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 06/23/14 | 1700 | 1397513 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: July 17, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2014-3584

Client Sample ID: CALA-14-79466
Sample ID: 351059008
Matrix: W
Collect Date: 18-JUN-14 09:53
Receive Date: 20-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| **EPA 300.0 Anions Liquid 28 day "As Received"** | | | | | | | | | | | |
| Bromide | J | 0.181 | 0.067 | 0.200 | mg/L | 1 | RXB5 | 06/24/14 | 0015 | 1398075 | 1 |
| Fluoride | | 0.693 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Chloride | | 15.5 | 0.335 | 1.00 | mg/L | 5 | MAR1 | 06/26/14 | 1451 | 1398075 | 2 |
| Sulfate | | 20.7 | 0.665 | 2.00 | mg/L | 5 | | | | | |
| **Nutrient Analysis** | | | | | | | | | | | |
| **EPA 350.1 Nitrogen, Ammonia L "As Received"** | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.0605 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 06/25/14 | 1258 | 1397518 | 3 |
| **EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"** | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 3.44 | 0.170 | 0.500 | mg/L | 10 | KLP1 | 06/26/14 | 1333 | 1397522 | 4 |
| **EPA 365.4 Phosphorus, Total in "As Received"** | | | | | | | | | | | |
| Phosphorus, Total as P | | 0.0756 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 06/24/14 | 1422 | 1397516 | 5 |
| **Solids Analysis** | | | | | | | | | | | |
| **EPA 160.1 Solids, Dissolved-F "As Received"** | | | | | | | | | | | |
| Total Dissolved Solids | | 163 | 3.40 | 14.3 | mg/L | | MXB3 | 06/24/14 | 1040 | 1398055 | 6 |
| **Titration and Ion Analysis** | | | | | | | | | | | |
| **EPA 150.1 pH "As Received"** | | | | | | | | | | | |
| pH at Temp 16.3C | H | 7.86 | 0.010 | 0.100 | SU | 1 | SXC5 | 07/03/14 | 1204 | 1400108 | 7 |
| **EPA 310.1 Total Alkalinity "As Received"** | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 83.3 | 0.725 | 1.00 | mg/L | | PXO1 | 07/02/14 | 2051 | 1400107 | 8 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| **EPA120.1 Specific Conductivity "As Received"** | | | | | | | | | | | |
| Conductivity | | 299 | 1.00 | 1.00 | umhos/cm | 1 | SXC5 | 07/07/14 | 1403 | 1400986 | 9 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 06/25/14 | 1105 | 1397517 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 06/23/14 | 1700 | 1397515 |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: July 17, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2014-3584 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CALA-14-79466 | Project: | ESHL00714 |
| Sample ID: | 351059008 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 300.0 | |
| 3 | EPA 350.1 | |
| 4 | EPA 353.2 | |
| 5 | EPA 365.4 | |
| 6 | EPA 160.1 | |
| 7 | EPA 150.1 | |
| 8 | EPA 310.1 | |
| 9 | EPA 120.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: July 17, 2014



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **351059**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | | |
| Batch 1397532 | | | | | | | | | | | | |
| QC1203113155 350951005 DUP | | | | | | | | | | | | |
| Total Organic Carbon Average | | | 1.35 | | 1.33 | mg/L | 1.94 | ^ | | (+/-1.00) | TSM | 06/20/14 23:18 |
| QC1203113159 LCS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 9.83 | mg/L | | | 98.3 | (85%-115%) | | 06/20/14 18:39 |
| QC1203113154 MB | | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | | 06/20/14 18:30 |
| QC1203113157 350951005 PS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | 1.35 | | 11.5 | mg/L | | | 101 | (65%-120%) | | 06/20/14 23:37 |
| **Flow Injection Analysis** | | | | | | | | | | | | |
| Batch 1397084 | | | | | | | | | | | | |
| QC1203113067 350951005 DUP | | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | | AXH3 | 06/24/14 08:56 |
| QC1203112039 LCS | | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 54.8 | ug/L | | | 110 | (90%-110%) | | 06/24/14 09:01 |
| QC1203112036 MB | | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | | 06/24/14 08:50 |
| QC1203113068 350951005 MS | | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 115 | ug/L | | | 114* | (90%-110%) | | 06/24/14 08:57 |
| **Ion Chromatography** | | | | | | | | | | | | |
| Batch 1398075 | | | | | | | | | | | | |
| QC1203114581 351059008 DUP | | | | | | | | | | | | |
| Bromide | | J | 0.181 | J | 0.197 | mg/L | 8.37 | ^ | | (+/-0.200) | RXB5 | 06/24/14 00:45 |
| Chloride | | | 15.5 | | 15.5 | mg/L | 0.0549 | | | (0%-20%) | MAR1 | 06/26/14 15:21 |
| Fluoride | | | 0.693 | | 0.600 | mg/L | 14.4 | | | (0%-20%) | RXB5 | 06/24/14 00:45 |
| Sulfate | | | 20.7 | | 21.1 | mg/L | 1.97 | | | (0%-20%) | MAR1 | 06/26/14 15:21 |
| QC1203114582 351141010 DUP | | | | | | | | | | | | |
| Bromide | | HU | ND | HU | ND | mg/L | N/A | | | | RXB5 | 06/24/14 02:45 |
| Chloride | | H | 3.97 | H | 3.97 | mg/L | 0.0126 | | | (0%-20%) | | |

## QC Summary

**Workorder: 351059**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1398075 | | | | | | | | | | | |
| Fluoride | | HU | ND | HJ | 0.0446 | mg/L | 200 | | | | |
| Sulfate | | H | 2.88 | H | 2.94 | mg/L | 2.01 | | (0%-20%) | RXB5 | 06/24/14 02:45 |
| QC1203114585 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.26 | mg/L | | 101 | (90%-110%) | | 06/23/14 23:46 |
| Chloride | 5.00 | | | | 5.11 | mg/L | | 102 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.62 | mg/L | | 105 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 10.4 | mg/L | | 104 | (90%-110%) | | |
| QC1203114580 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 06/23/14 23:16 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203114583 351059008 PS | | | | | | | | | | | |
| Bromide | 1.25 | J | 0.181 | | 1.46 | mg/L | | 103 | (90%-110%) | | 06/24/14 01:15 |
| Chloride | 5.00 | | 3.09 | | 8.50 | mg/L | | 108 | (90%-110%) | MAR1 | 06/26/14 15:50 |
| Fluoride | 2.50 | | 0.693 | | 3.30 | mg/L | | 104 | (90%-110%) | RXB5 | 06/24/14 01:15 |
| Sulfate | 10.0 | | 4.14 | | 14.8 | mg/L | | 107 | (90%-110%) | MAR1 | 06/26/14 15:50 |
| QC1203114584 351141010 PS | | | | | | | | | | | |
| Bromide | 1.25 | HU | ND | H | 1.27 | mg/L | | 102 | (90%-110%) | RXB5 | 06/24/14 03:15 |
| Chloride | 5.00 | H | 3.97 | H | 9.61 | mg/L | | 113* | (90%-110%) | | |
| Fluoride | 2.50 | HU | ND | H | 2.63 | mg/L | | 105 | (90%-110%) | | |
| Sulfate | 10.0 | H | 2.88 | H | 13.4 | mg/L | | 105 | (90%-110%) | | |
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1397514 | | | | | | | | | | | |
| QC1203113091 350748001 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | 0.159 | U | ND | mg/L | 241*^ | | (+/-0.100) | KLP1 | 06/24/14 12:02 |
| QC1203113094 350951005 DUP | | | | | | | | | | | |

## QC Summary

**Workorder:** **351059**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1397514 | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | | | 06/24/14 12:17 |
| QC1203113101 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 0.934 | mg/L | | 93.4 | (90%-110%) | KLP1 | 06/24/14 12:00 |
| QC1203113090 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | J | 0.0414 | mg/L | | | | | 06/24/14 11:59 |
| QC1203113096 350748001 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | 0.159 | | 0.886 | mg/L | | 72.7* | (90%-110%) | | 06/24/14 12:03 |
| QC1203113099 350951005 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 0.960 | mg/L | | 96 | (90%-110%) | | 06/24/14 12:18 |
| Batch 1397516 | | | | | | | | | | | |
| QC1203113103 350748001 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | J | 0.0188 | J | 0.0225 | mg/L | 17.9 ^ | | (+/-0.050) | KLP1 | 06/24/14 13:57 |
| QC1203113104 350774001 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | | 7.63 | | 5.12 | mg/L | 39.4* | | (0%-20%) | | 06/24/14 14:24 |
| QC1203113106 350951008 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | J | 0.032 | J | 0.0325 | mg/L | 1.55 ^ | | (+/-0.050) | | 06/24/14 14:10 |
| QC1203113113 LCS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 0.992 | mg/L | | 99.2 | (79%-126%) | | 06/24/14 13:55 |
| QC1203113102 MB | | | | | | | | | | | |
| Phosphorus, Total as P | | | | U | ND | mg/L | | | | | 06/24/14 13:54 |
| QC1203113108 350748001 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | J | 0.0188 | | 1.13 | mg/L | | 111 | (64%-134%) | | 06/24/14 13:58 |
| QC1203113109 350774001 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | 7.63 | | 4.16 | mg/L | | N/A | (64%-134%) | | 06/24/14 14:25 |
| QC1203113111 350951008 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | J | 0.032 | | 1.06 | mg/L | | 103 | (64%-134%) | | 06/24/14 14:11 |
| Batch 1397518 | | | | | | | | | | | |
| QC1203113115 350774001 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | | 0.498 | | 0.579 | mg/L | 15.0 | | (0%-20%) | KLP1 | 06/25/14 12:32 |
| QC1203113116 350951008 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | U | ND | U | ND | mg/L | N/A | | | | 06/25/14 12:42 |
| QC1203113123 LCS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 1.02 | mg/L | | 102 | (90%-110%) | | 06/25/14 12:30 |

## QC Summary

**Workorder: 351059**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1397518 | | | | | | | | | | | |
| QC1203113114 MB | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | U | ND | mg/L | | | | KLP1 | 06/25/14 12:29 |
| QC1203113119 350774001 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | 0.498 | | 1.51 | mg/L | | 101 | (90%-110%) | | 06/25/14 12:33 |
| QC1203113120 350951008 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | U | ND | | 1.04 | mg/L | | 103 | (90%-110%) | | 06/25/14 12:43 |
| Batch 1397522 | | | | | | | | | | | |
| QC1203113135 350774001 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 11.1 | | 9.20 | mg/L | 18.3 ^ | | (+/-2.50) | KLP1 | 06/26/14 14:10 |
| QC1203113137 350951008 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 0.496 | | 0.496 | mg/L | 0.00 | | (0%-20%) | | 06/26/14 13:16 |
| QC1203113141 LCS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 0.947 | mg/L | | 94.7 | (90%-110%) | | 06/26/14 12:13 |
| QC1203113134 MB | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | | J | 0.0281 | mg/L | | | | | 06/26/14 12:12 |
| QC1203113138 350774001 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.221 | | 1.20 | mg/L | | 97.9 | (90%-110%) | | 06/26/14 14:11 |
| QC1203113140 350951008 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.496 | | 1.52 | mg/L | | 102 | (90%-110%) | | 06/26/14 13:17 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1398055 | | | | | | | | | | | |
| QC1203114532 350951008 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 377 | | 377 | mg/L | 0.760 | | (0%-10%) | MXB3 | 06/24/14 10:40 |
| QC1203114536 LCS | | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | | 294 | mg/L | | 98.1 | (95%-105%) | | 06/24/14 10:40 |
| QC1203114531 MB | | | | | | | | | | | |
| Total Dissolved Solids | | | | U | ND | mg/L | | | | | 06/24/14 10:40 |
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1400107 | | | | | | | | | | | |
| QC1203119748 351059008 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | 83.3 | | 82.8 | mg/L | 0.635 | | (0%-20%) | PXO1 | 07/02/14 20:53 |
| Carbonate alkalinity (CaCO3) | | U | ND | U | ND | mg/L | N/A | | | | |

## QC Summary

**Workorder:** **351059**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1400107 | | | | | | | | | | | |
| QC1203119753 LCS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | | 52.2 | mg/L | | 104 | (90%-110%) | PXO1 | 07/02/14 19:03 |
| QC1203119743 MB | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | | U | ND | mg/L | | | | | 07/02/14 19:03 |
| Carbonate alkalinity (CaCO3) | | | | U | ND | mg/L | | | | | |
| QC1203119752 351059008 MS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | 83.3 | | 133 | mg/L | | 100 | (80%-120%) | | 07/02/14 20:56 |
| Batch 1400108 | | | | | | | | | | | |
| QC1203119756 350951008 DUP | | | | | | | | | | | |
| pH | | H | 8.05 | H | 8.06 | SU | 0.124 | | (0%-10%) | SXC5 | 07/03/14 11:57 |
| QC1203119758 LCS | | | | | | | | | | | |
| pH | 7.00 | | | | 6.99 | SU | | 99.9 | (99%-101%) | | 07/03/14 11:32 |
| Batch 1400986 | | | | | | | | | | | |
| QC1203121764 351059008 DUP | | | | | | | | | | | |
| Conductivity | | | 299 | | 299 | umhos/cm | 0.00 | | (0%-10%) | SXC5 | 07/07/14 14:04 |
| QC1203121763 LCS | | | | | | | | | | | |
| Conductivity | 1410 | | | | 1350 | umhos/cm | | 95.5 | (95%-105%) | | 07/07/14 13:57 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |

## QC Summary

**Workorder:** **351059**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 24-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 335.4, SW846 9012B | Liquid | ESHL, UCOR |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397084 | See Below | | |

**Potentially affected work order(s)(SDG): 350892,350951(2014-3574),351053,351059(2014-3584)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203112038MS,1203113068MS | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference. 1203112038MS<br>The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203113068MS |

**Originator's Name:**

Aubrey Kingsbury 24-JUN-14

**Data Validator/Group Leader:**

Kristen Parson 24-JUN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 24-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 351.2, EPA 351.2 SC | Liquid | AECM, BETT, BRKL, ESHL, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397514 | See Below | | |

**Potentially affected work order(s)(SDG):** **349867(34201),350748(2014-3561),350845(14066263),350951(2014-3574),350966(LMP14029013A_WCH),351059(2014-3584)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br>QC 1203113096MS,1203113097MS,<br>1203113098MS,<br>1203113100MS<br>2. Failed RPD for DUP:<br>QC 1203113091DUP,<br>1203113092DUP,<br>1203113093DUP,<br>1203113095DUP | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference.<br>2. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 24-JUN-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 24-JUN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 24-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 365.4 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1397516 | See Below | | |

**Potentially affected work order(s)(SDG): 350748(2014-3561),350774(2014-3565),350951(2014-3574),351059(2014-3584)**

**Application Issues:**

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203113104DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 24-JUN-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 24-JUN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 28-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| IC | EPA 300.0 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1398075 | See Below | | |

**Potentially affected work order(s)(SDG): 351059(2014-3584),351139(2014-3591),351141(2014-3594)**

**Application Issues:**

Failed Recovery for MS/PS

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203114584PS | 1. The MS/PS mixture contains seven anions of interest. Of those, all requested anions except chloride met normal acceptance criteria for recovery (90 - 110%). This failure is attributed to the matrix of the sample because the successful recovery of the other compounds indicate that the laboratory process was in control. This variance is judged to have no negative impact on the data. The deviation is noted in the Case Narrative and DER, and the data has been reported. |
| 2. Sample received out of holding:<br><br>351139 008<br><br>351141 010<br><br>QC 1203114582DUP,<br><br>1203114584PS | 2. Sample Received out of holding (Contact PM for Comments) |

**Originator's Name:**

Mary Sherwood 28-JUN-14

**Data Validator/Group Leader:**

Thomas Lewis 17-JUL-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 03-JUL-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ELECTRODE | See Below | Liquid | BETT, DMAX, ESHL, HMSA, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1400108 | See Below | | |

**Potentially affected work order(s)(SDG):** **350760(2014-3562),350854,350951(2014-3574),351059(2014-3584),351120(X0060),351139(2014-3591),351445,351468,351482,351554(GEL351554),351636,351695(GEL351695)**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| Test/Methods: EPA 150.1, SM 4500-H B, SW846 9040B/9040C, SW846 9040C<br><br>1. Sample received out of holding:<br><br>350760 001,003<br>350854 002,006,010<br>350951 008,022<br>351059 008<br>351120 001<br>351139 010<br>351445 001<br>351468 001<br>351482 002<br>351554 001,002,003<br>351636 001,002,004<br>351695 001 | 1. Samples were received by laboratory outside of method specified holding time. |

**Originator's Name:**
Sarah Carson 03-JUL-14

**Data Validator/Group Leader:**
Elzbieta Szulc 03-JUL-14

# Radiological Analysis

**Radiochemistry Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3584**
**Work Order 351059**

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec U, Liquid** |
| Analytical Method: | DOE EML HASL-300, U-02-RC Modified |
| Analytical Batch Number: | 1397164 |

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203112268 | Method Blank (MB) |
| 1203112269 | 350951005(CALA-14-79458) Sample Duplicate (DUP) |
| 1203112270 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203112268 (MB) and 1203112270 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 350951005 (CALA-14-79458). The QC was from ARSL work order 350951.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Am241 Liquid** |
| Analytical Method: | DOE EML HASL-300, Am-05-RC Modified |
| Analytical Batch Number: | 1398720 |

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203116111 | Method Blank (MB) |
| 1203116112 | 351059005(CALA-14-79460) Sample Duplicate (DUP) |
| 1203116113 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203116111 (MB) and 1203116113 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 351059005 (CALA-14-79460). The QC was from ARSL work order 351059.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
Samples were reprepped due to high blank activity. The re-analysis is being reported.

**Recounts**
Samples 1203116112 (CALA-14-79460) and 351059005 (CALA-14-79460) were recounted due to high MDCs. The recounts are reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Pu, Liquid** |
| Analytical Method: | DOE EML HASL-300, Pu-11-RC Modified |
| Analytical Batch Number: | 1398721 |

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203116114 | Method Blank (MB) |
| 1203116115 | 351059005(CALA-14-79460) Sample Duplicate (DUP) |
| 1203116116 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203116114 (MB) and 1203116116 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 351059005 (CALA-14-79460). The QC was from ARSL work order 351059.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
The batch was reprepped due to suspected contamination. The re-analysis is reported.

**Recounts**
Sample 1203116114 (MB) was recounted twice due to a peak shift and poor resolution and was then given additional clean-up steps and recounted in order to improve the resolution. The fourth count is reported. Samples 1203116115 (CALA-14-79460) and 351059005 (CALA-14-79460) were recounted due to high MDCs. The samples were then given additional clean-up steps and recounted in order to improve the resolution. Due to a low tracer yield recovery after the clean-up steps the second counts are reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1313789 was generated due to Other and Peak Centroid Values Off. 1. Samples 350951019 and 351059005 do not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 2. The Pu-242 tracer peak centroid for sample 350951019 is greater than 50 keV from the expected energy value of 4890 keV. 1. The samples do meet the tracer yield requirement, the detection limits, and their tracer peaks are within the Pu-242 region of interest. Reporting results. 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population. Samples 1203116115 (CALA-14-79460) and 351059005 (CALA-14-79460) did not meet the client's yield requirement. However, there are 400 tracer counts, GEL's standard tracer yield requirements are met, and the client's detection limits are met.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Gammaspec** |
| Analytical Method: | EPA 901.1 |
| Analytical Batch Number: | 1398331 |

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203115102 | Method Blank (MB) |
| 1203115103 | 351059005(CALA-14-79460) Sample Duplicate (DUP) |
| 1203115104 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibrations were performed in July 2013, August 2013 and December 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
The blank volume is representative of the sample volume in this batch.

**Designated QC**
The following sample was used for QC: 351059005 (CALA-14-79460). The QC was from ARSL work order 351059.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
Additional comments were not required for this sample set.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **GFPC, Sr90, liquid** |
| Analytical Method: | EPA 905.0 Modified |
| Analytical Batch Number: | 1399646 |

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203118495 | Method Blank (MB) |
| 1203118496 | 351467001(CALA-14-79747) Sample Duplicate (DUP) |
| 1203118497 | 351467001(CALA-14-79747) Matrix Spike (MS) |
| 1203118498 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in March 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203118495 (MB) and 1203118498 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 351467001 (CALA-14-79747). The QC was from ARSL work order 351467.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**
Sample 1203118496 (CALA-14-79747) was recounted due to a suspected false positive. The recount is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike, 1203118497 (CALA-14-79747), aliquot was reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **WSP-GrossA/B** |
| Analytical Method: | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1399669 |

| Sample ID | Client ID |
|---|---|
| 351059005 | CALA-14-79460 |
| 1203118572 | Method Blank (MB) |
| 1203118573 | 351467001(CALA-14-79747) Sample Duplicate (DUP) |
| 1203118574 | 351467001(CALA-14-79747) Matrix Spike (MS) |
| 1203118575 | 351467001(CALA-14-79747) Matrix Spike Duplicate (MSD) |
| 1203118576 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203118572 (MB) and 1203118576 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 351467001 (CALA-14-79747). The QC was from ARSL work order 351467.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank, 1203118572 (MB), beta result is greater than 1.65 times the CSU but less than the MDC.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Gross Alpha/Beta Preparation Information**
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike and matrix spike duplicate, 1203118574 (CALA-14-79747) and 1203118575 (CALA-14-79747), aliquots were reduced to conserve sample volume.

**Blank Decision Level**
The blank, 1203118572 (MB), beta result is greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3584  GEL Work Order: 351059

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Theresa L. Austin  **Name: Theresa Austin**

**Date: 14 JUL 2014**  **Title: Group Leader**

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 14-JUL-14 | Radiochemistry | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ALPHA SPECTROMETER | DOE EML HASL-300, Pu-11-RC Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1398721 | See Below | | |

**Potentially affected work order(s)(SDG): 350951(2014-3574),351059(2014-3584)**

**Application Issues:**

Other

Peak Centroid Values Off

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Samples 350951019 and 351059005 do not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. | 1. The samples do meet the tracer yield requirement, the detection limits, and their tracer peaks are within the Pu-242 region of interest. Reporting results. |
| 2. The Pu-242 tracer peak centroid for sample 350951019 is greater than 50 keV from the expected energy value of 4890 keV. | 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results. |

**Originator's Name:**

Melanie Aycock 14-JUL-14

**Data Validator/Group Leader:**

Kate Gellatly 14-JUL-14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545 Report Date: July 14, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CALA-14-79460
Sample ID: 351059005
Matrix: W
Collect Date: 18-JUN-14
Receive Date: 20-JUN-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.00199 | +/-0.00596 | 0.0368 | 0.016 | +/-0.00597 | 0.050 | pCi/L | | JXR1 | 07/08/14 | 1522 | 1398720 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00247 | +/-0.00499 | 0.0275 | 0.0104 | +/-0.00499 | 0.050 | pCi/L | | JXR1 | 07/08/14 | 1522 | 1398721 | 2 |
| Plutonium-239/240 | U | 0.0102 | +/-0.00932 | 0.053 | 0.0232 | +/-0.00933 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 1.20 | +/-0.0556 | 0.0656 | 0.0293 | +/-0.0951 | 1.00 | pCi/L | | JXR1 | 06/24/14 | 1429 | 1397164 | 3 |
| Uranium-235/236 | U | 0.047 | +/-0.0129 | 0.055 | 0.0232 | +/-0.0133 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.674 | +/-0.0418 | 0.0368 | 0.015 | +/-0.0601 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | -1.61 | +/-1.49 | 5.37 | 2.44 | +/-1.54 | 8.00 | pCi/L | | MJH1 | 06/30/14 | 0925 | 1398331 | 4 |
| Cobalt-60 | U | -0.482 | +/-1.30 | 4.79 | 2.05 | +/-1.31 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | 0.231 | +/-2.73 | 9.59 | 4.46 | +/-2.73 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | 11.6 | +/-16.4 | 63.1 | 28.1 | +/-16.6 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | 0.0431 | +/-1.08 | 4.25 | 1.79 | +/-1.08 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | 0.0468 | +/-0.0967 | 0.357 | 0.152 | +/-0.0968 | 0.500 | pCi/L | | KSD1 | 07/07/14 | 0959 | 1399646 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | | 5.79 | +/-0.740 | 1.66 | 0.745 | +/-0.888 | 3.00 | pCi/L | | JXH3 | 07/07/14 | 1237 | 1399669 | 6 |
| Alpha | U | 0.905 | +/-0.447 | 1.45 | 0.671 | +/-0.453 | 3.00 | pCi/L | | JXH3 | 07/10/14 | 1710 | 1399669 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1398720 | 70.9 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1398721 | 43.6 * | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1397164 | 87.6 | (50%-105%) |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: July 14, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CALA-14-79460
Sample ID: 351059005

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1399646 | 84.1 | (50%-105%) |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# Quality Control Data

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

**Report Date: July 14, 2014**


**Client :** **Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**

**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **351059**

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1397164 | | | | | | | | | | |
| QC1203112269 350951005 DUP | | | | | | | | | | |
| Uranium-234 | | 1.10 | | 1.05 | pCi/L | 0.150 | | (0-1) | JXR1 | 06/24/1414:29 |
| | Uncert: | +/-0.0522 | | +/-0.0516 | | | | | | |
| | TPU: | +/-0.0876 | | +/-0.0847 | | | | | | |
| Uranium-235/236 | U | 0.045 | U | 0.0489 | pCi/L | 0.0705 | | (0-1) | | |
| | Uncert: | +/-0.0131 | | +/-0.0137 | | | | | | |
| | TPU: | +/-0.0134 | | +/-0.014 | | | | | | |
| Uranium-238 | | 0.743 | | 0.692 | pCi/L | 0.204 | | (0-1) | | |
| | Uncert: | +/-0.0427 | | +/-0.0418 | | | | | | |
| | TPU: | +/-0.0638 | | +/-0.0609 | | | | | | |
| **Uranium-232 Tracer | 2.74 | 2.51 | | 2.73 | pCi/L | | 99.7 | (50%-105%) | | |
| | Uncert: | +/-0.0822 | | +/-0.0826 | | | | | | |
| | TPU: | +/-0.194 | | +/-0.194 | | | | | | |
| QC1203112270 LCS | | | | | | | | | | |
| Uranium-234 | | | | 2.48 | pCi/L | | | | JXR1 | 06/24/1414:29 |
| | Uncert: | | | +/-0.0717 | | | | | | |
| | TPU: | | | +/-0.175 | | | | | | |
| Uranium-235/236 | | | | 0.133 | pCi/L | | | | | |
| | Uncert: | | | +/-0.0191 | | | | | | |
| | TPU: | | | +/-0.0209 | | | | | | |
| Uranium-238 | 2.72 | | | 2.69 | pCi/L | | 98.9 | (80%-120%) | | |
| | Uncert: | | | +/-0.0747 | | | | | | |
| | TPU: | | | +/-0.188 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.85 | pCi/L | | 84.2 | (50%-105%) | | |
| | Uncert: | | | +/-0.0676 | | | | | | |
| | TPU: | | | +/-0.156 | | | | | | |
| QC1203112268 MB | | | | | | | | | | |
| Uranium-234 | | | U | 0.00 | pCi/L | | | | JXR1 | 06/24/1414:29 |
| | Uncert: | | | +/-0.0054 | | | | | | |
| | TPU: | | | +/-0.0054 | | | | | | |
| Uranium-235/236 | | | U | 0.00 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00385 | | | | | | |
| | TPU: | | | +/-0.00385 | | | | | | |
| Uranium-238 | | | U | -0.00441 | pCi/L | | | | | |
| | Uncert: | | | +/-0.0054 | | | | | | |
| | TPU: | | | +/-0.0054 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.97 | pCi/L | | 89.9 | (50%-105%) | | |
| | Uncert: | | | +/-0.070 | | | | | | |
| | TPU: | | | +/-0.159 | | | | | | |
| Batch 1398720 | | | | | | | | | | |
| QC1203116112 351059005 DUP | | | | | | | | | | |
| Americium-241 | U | 0.00199 | U | 0.0142 | pCi/L | 0.290 | | (0-1) | JXR1 | 07/08/1415:22 |

## QC Summary

**Workorder: 351059**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1398720 | | | | | | | | | | |
| | Uncert: | +/-0.00596 | | +/-0.00591 | | | | | | |
| | TPU: | +/-0.00597 | | +/-0.00594 | | | | | | |
| **Americium-243 Tracer | 2.73 | 1.94 | | 1.99 | pCi/L | | 72.7 | (50%-105%) | | |
| | Uncert: | +/-0.0697 | | +/-0.0696 | | | | | | |
| | TPU: | +/-0.125 | | +/-0.125 | | | | | | |
| QC1203116113 LCS | | | | | | | | | | |
| Americium-241 | 1.41 | | | 1.47 | pCi/L | | 104 | (80%-120%) | JXR1 | 07/07/1414:28 |
| | Uncert: | | | +/-0.0529 | | | | | | |
| | TPU: | | | +/-0.0801 | | | | | | |
| **Americium-243 Tracer | 2.19 | | | 2.23 | pCi/L | | 102 | (50%-105%) | | |
| | Uncert: | | | +/-0.0641 | | | | | | |
| | TPU: | | | +/-0.110 | | | | | | |
| QC1203116111 MB | | | | | | | | | | |
| Americium-241 | | | U | 0.00 | pCi/L | | | | JXR1 | 07/07/1414:27 |
| | Uncert: | | | +/-0.00273 | | | | | | |
| | TPU: | | | +/-0.00273 | | | | | | |
| **Americium-243 Tracer | 2.19 | | | 2.06 | pCi/L | | 94.4 | (50%-105%) | | |
| | Uncert: | | | +/-0.0647 | | | | | | |
| | TPU: | | | +/-0.111 | | | | | | |
| Batch 1398721 | | | | | | | | | | |
| QC1203116115 351059005 DUP | | | | | | | | | | |
| Plutonium-238 | U | 0.00247 | U | -0.00107 | pCi/L | 0.161 | | (0-1) | JXR1 | 07/08/1415:22 |
| | Uncert: | +/-0.00499 | | +/-0.00603 | | | | | | |
| | TPU: | +/-0.00499 | | +/-0.00603 | | | | | | |
| Plutonium-239/240 | U | 0.0102 | U | 0.00623 | pCi/L | 0.119 | | (0-1) | | |
| | Uncert: | +/-0.00932 | | +/-0.00735 | | | | | | |
| | TPU: | +/-0.00933 | | +/-0.00736 | | | | | | |
| **Plutonium-242 Tracer | 2.41 | 1.05 | | 1.11 | pCi/L | | 46.1 * | (50%-105%) | | |
| | Uncert: | +/-0.0776 | | +/-0.0773 | | | | | | |
| | TPU: | +/-0.129 | | +/-0.128 | | | | | | |
| QC1203116116 LCS | | | | | | | | | | |
| Plutonium-238 | | | U | 0.011 | pCi/L | | | (80%-120%) | JXR1 | 07/07/1414:33 |
| | Uncert: | | | +/-0.00584 | | | | | | |
| | TPU: | | | +/-0.00586 | | | | | | |
| Plutonium-239/240 | 1.97 | | | 1.78 | pCi/L | | 90.1 | (80%-120%) | | |
| | Uncert: | | | +/-0.0626 | | | | | | |
| | TPU: | | | +/-0.100 | | | | | | |
| **Plutonium-242 Tracer | 1.93 | | | 1.54 | pCi/L | | 79.8 | (50%-105%) | | |
| | Uncert: | | | +/-0.0655 | | | | | | |
| | TPU: | | | +/-0.107 | | | | | | |
| QC1203116114 MB | | | | | | | | | | |
| Plutonium-238 | | | U | -0.00648 | pCi/L | | | | JXR1 | 07/12/1410:51 |
| | Uncert: | | | +/-0.00604 | | | | | | |
| | TPU: | | | +/-0.00604 | | | | | | |
| Plutonium-239/240 | | | U | 0.008 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00716 | | | | | | |

## QC Summary

**Workorder: 351059**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1398721 | | | | | | | | | | |
| | TPU: | | | +/-0.00717 | | | | | | |
| **Plutonium-242 Tracer | 1.93 | | | 1.01 | pCi/L | | 52.6 | (50%-105%) | | |
| | Uncert: | | | +/-0.0664 | | | | | | |
| | TPU: | | | +/-0.108 | | | | | | |
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1398331 | | | | | | | | | | |
| QC1203115103 351059005 DUP | | | | | | | | | | |
| Cesium-137 | U | -1.61 | U | -3.59 | pCi/L | 0.314 | | (0-1) | MJH1 | 06/30/1411:48 |
| | Uncert: | +/-1.49 | | +/-1.39 | | | | | | |
| | TPU: | +/-1.54 | | +/-1.62 | | | | | | |
| Cobalt-60 | U | -0.482 | U | -1.45 | pCi/L | 0.191 | | (0-1) | | |
| | Uncert: | +/-1.30 | | +/-1.18 | | | | | | |
| | TPU: | +/-1.31 | | +/-1.23 | | | | | | |
| Neptunium-237 | U | 0.231 | U | -2.04 | pCi/L | 0.223 | | (0-1) | | |
| | Uncert: | +/-2.73 | | +/-2.30 | | | | | | |
| | TPU: | +/-2.73 | | +/-2.35 | | | | | | |
| Potassium-40 | U | 11.6 | U | 3.14 | pCi/L | 0.124 | | (0-1) | | |
| | Uncert: | +/-16.4 | | +/-17.3 | | | | | | |
| | TPU: | +/-16.6 | | +/-17.3 | | | | | | |
| Sodium-22 | U | 0.0431 | U | -0.499 | pCi/L | 0.117 | | (0-1) | | |
| | Uncert: | +/-1.08 | | +/-1.23 | | | | | | |
| | TPU: | +/-1.08 | | +/-1.23 | | | | | | |
| QC1203115104 LCS | | | | | | | | | | |
| Americium-241 | 34500 | | | 36000 | pCi/L | | 104 | (80%-120%) | MJH1 | 07/01/1410:05 |
| | Uncert: | | | +/-458 | | | | | | |
| | TPU: | | | +/-2160 | | | | | | |
| Cesium-137 | 14100 | | | 13900 | pCi/L | | 98.9 | (80%-120%) | | |
| | Uncert: | | | +/-94.5 | | | | | | |
| | TPU: | | | +/-616 | | | | | | |
| Cobalt-60 | 17600 | | | 18000 | pCi/L | | 103 | (80%-120%) | | |
| | Uncert: | | | +/-117 | | | | | | |
| | TPU: | | | +/-742 | | | | | | |
| Neptunium-237 | | | U | 52.0 | pCi/L | | | | | |
| | Uncert: | | | +/-42.6 | | | | | | |
| | TPU: | | | +/-44.3 | | | | | | |
| Potassium-40 | | | U | 26.1 | pCi/L | | | | | |
| | Uncert: | | | +/-89.1 | | | | | | |
| | TPU: | | | +/-89.3 | | | | | | |
| Sodium-22 | | | U | -4.3 | pCi/L | | | | | |
| | Uncert: | | | +/-13.4 | | | | | | |
| | TPU: | | | +/-13.4 | | | | | | |
| QC1203115102 MB | | | | | | | | | | |
| Cesium-137 | | | U | -0.768 | pCi/L | | | | MJH1 | 06/30/1409:26 |
| | Uncert: | | | +/-1.27 | | | | | | |
| | TPU: | | | +/-1.28 | | | | | | |
| Cobalt-60 | | | U | -0.929 | pCi/L | | | | | |

## QC Summary

**Workorder: 351059**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1398331 | | | | | | | | | | |
| | Uncert: | | | +/-1.49 | | | | | | |
| | TPU: | | | +/-1.50 | | | | | | |
| Neptunium-237 | | | U | 3.04 | pCi/L | | | | | |
| | Uncert: | | | +/-2.49 | | | | | | |
| | TPU: | | | +/-2.59 | | | | | | |
| Potassium-40 | | | U | -2.82 | pCi/L | | | | | |
| | Uncert: | | | +/-15.5 | | | | | | |
| | TPU: | | | +/-15.6 | | | | | | |
| Sodium-22 | | | U | -0.945 | pCi/L | | | | | |
| | Uncert: | | | +/-1.12 | | | | | | |
| | TPU: | | | +/-1.14 | | | | | | |
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1399646 | | | | | | | | | | |
| QC1203118496 351467001 DUP | | | | | | | | | | |
| Strontium-90 | U | 0.0256 | U | -0.183 | pCi/L | 0.693 | | (0-1) | KSD1 | 07/08/1414:35 |
| | Uncert: | +/-0.0851 | | +/-0.0655 | | | | | | |
| | TPU: | +/-0.0851 | | +/-0.0655 | | | | | | |
| **Strontium Carrier | 8.20 | 7.60 | | 7.50 | mg | | 91.5 | (50%-105%) | | |
| QC1203118498 LCS | | | | | | | | | | |
| Strontium-90 | 22.6 | | | 22.1 | pCi/L | | 97.7 | (80%-120%) | KSD1 | 07/07/1410:47 |
| | Uncert: | | | +/-0.532 | | | | | | |
| | TPU: | | | +/-1.85 | | | | | | |
| **Strontium Carrier | 8.20 | | | 6.80 | mg | | 82.9 | (50%-105%) | | |
| QC1203118495 MB | | | | | | | | | | |
| Strontium-90 | | | U | 0.0264 | pCi/L | | | | KSD1 | 07/07/1410:47 |
| | Uncert: | | | +/-0.121 | | | | | | |
| | TPU: | | | +/-0.121 | | | | | | |
| **Strontium Carrier | 8.20 | | | 7.50 | mg | | 91.5 | (50%-105%) | | |
| QC1203118497 351467001 MS | | | | | | | | | | |
| Strontium-90 | 226 U | 0.0256 | | 222 | pCi/L | | 98.3 | (75%-125%) | KSD1 | 07/07/1410:48 |
| | Uncert: | +/-0.0851 | | +/-5.05 | | | | | | |
| | TPU: | +/-0.0851 | | +/-18.5 | | | | | | |
| **Strontium Carrier | 8.20 | 7.60 | | 7.50 | mg | | 91.5 | (50%-105%) | | |
| Batch 1399669 | | | | | | | | | | |
| QC1203118573 351467001 DUP | | | | | | | | | | |
| Alpha | U | -0.336 | U | -0.403 | pCi/L | 0.0554 | | (0-1) | JXH3 | 07/10/1417:07 |
| | Uncert: | +/-0.310 | | +/-0.293 | | | | | | |
| | TPU: | +/-0.310 | | +/-0.293 | | | | | | |
| Beta | | 3.30 | | 4.45 | pCi/L | 0.312 | | (0-1) | | 07/07/1412:37 |
| | Uncert: | +/-0.723 | | +/-0.988 | | | | | | |
| | TPU: | +/-0.774 | | +/-1.06 | | | | | | |
| QC1203118576 LCS | | | | | | | | | | |
| Alpha | 12.3 | | | 12.9 | pCi/L | | 104 | (80%-120%) | JXH3 | 07/10/1417:07 |
| | Uncert: | | | +/-0.643 | | | | | | |
| | TPU: | | | +/-1.31 | | | | | | |

## QC Summary

**Workorder:** **351059**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1399669 | | | | | | | | | | |
| Beta | 45.2 | | | 50.2 | pCi/L | | 111 | (80%-120%) | | |
| | Uncert: | | | +/-0.913 | | | | | | |
| | TPU: | | | +/-4.25 | | | | | | |
| QC1203118572 MB | | | | | | | | | | |
| Alpha | | | U | -0.0926 | pCi/L | | | | JXH3 | 07/10/1417:07 |
| | Uncert: | | | +/-0.0274 | | | | | | |
| | TPU: | | | +/-0.0274 | | | | | | |
| Beta | | | U | 0.398 | pCi/L | | | | | 07/08/1408:58 |
| | Uncert: | | | +/-0.180 | | | | | | |
| | TPU: | | | +/-0.183 | | | | | | |
| QC1203118574 351467001 MS | | | | | | | | | | |
| Alpha | 165 U | -0.336 | | 164 | pCi/L | | 99.8 | (75%-125%) | JXH3 | 07/10/1417:07 |
| | Uncert: | +/-0.310 | | +/-9.25 | | | | | | |
| | TPU: | +/-0.310 | | +/-17.2 | | | | | | |
| Beta | 602 | 3.30 | | 693 | pCi/L | | 115 | (75%-125%) | | 07/08/1408:58 |
| | Uncert: | +/-0.723 | | +/-12.6 | | | | | | |
| | TPU: | +/-0.774 | | +/-58.9 | | | | | | |
| QC1203118575 351467001 MSD | | | | | | | | | | |
| Alpha | 165 U | -0.336 | | 175 | pCi/L | 0.151 | 106 | (0-1) | JXH3 | 07/10/1417:07 |
| | Uncert: | +/-0.310 | | +/-9.30 | | | | | | |
| | TPU: | +/-0.310 | | +/-18.1 | | | | | | |
| Beta | 602 | 3.30 | | 670 | pCi/L | 0.100 | 111 | (0-1) | | 07/08/1408:58 |
| | Uncert: | +/-0.723 | | +/-12.4 | | | | | | |
| | TPU: | +/-0.774 | | +/-57.0 | | | | | | |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

| | |
|---|---|
| ** | Analyte is a Tracer compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| BD | Results are either below the MDC or tracer recovery is low |
| FA | Failed analysis. |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| K | Analyte present. Reported value may be biased high. Actual value is expected to be lower. |
| L | Analyte present. Reported value may be biased low. Actual value is expected to be higher. |
| M | M if above MDC and less than LLD |
| M | REMP Result > MDC/CL and < RDL |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |

# QC Summary

**Workorder:** **351059**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| UI | Gamma Spectroscopy--Uncertain identification |
| UJ | Gamma Spectroscopy--Uncertain identification |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | Other specific qualifiers were required to properly define the results. Consult case narrative. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
** Indicates analyte is a surrogate/tracer compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

American Radiation Services - Primary

1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEP

**COC/Lab Request #:** 2014-3585



**Client Contact:**

**Lab Agreement # :** 63641-001-10

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CALA-14-79460 | Jun 18 2014 | 09:53 | W | 1 |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 6/19/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79460

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 6/18/2013 | **FIELD MATRIX:** | WG | OK |
| **TIME COLLECTED (HH:MM):** | | 0953 | **MEDIA:** | UA | |
| **PRS ID:** | | OK | **SAMPLE TECH CODE:** | UA | PP |
| **LOCATION ID:** | Vine Tree Spring | | **FIELD PREP:** | UF | OK |
| **LOCATION TYPE:** | SPR | | **FIELD QC TYPE:** | REG | |
| **PORT:** | | | **SAMPLE USAGE:** | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | X | N/A |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | 3 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 3 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS | 3 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8081A-HCB | 1 LITER AMBER GLASS | 2 | ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 5702

**EVENT NAME:** LA/Pueblo (General Surveillance) Q3 MY2014 Sampling Event_Los Alamos

**SAMPLE ID:** CALA-14-79460

**WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | Y | N/A |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 7.55 mg/L Flow (in gpm) 7.6 GPM Oxidation-Reduction Potential N/A mV

pH 7.96 SU Specific Conductance 295 uS/cm Temperature 14.26 deg C

Turbidity 2.6 NTU

**COLLECTED BY (PRINT)** W. Shaw

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| William Shaw | 6/18/2014 1215 | A. Martinez | 6/18/14 1215 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 05/30/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-3585

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| ARS1-14-01566 | Generic:Low_Level_Tritium | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-14-01566 | Generic:Low_Level_Tritium | ARS1-B14- | ARS1-B14- | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| Generic:Low_Level_Tritium | RAD | CALA-14-79460 | ARS1-B14-01354-14 | REG | 1 | 0 | 0 | 0 |
| Generic:Low_Level_Tritium | RAD | LCS | ARS1-B14-01354-01 | LCS | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | LCSD | ARS1-B14-01354-02 | LCSD | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | MB | ARS1-B14-01354-03 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

# DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-01354-01 | ARS1-B14-01354-02 | Generic:Low_Level_Tritium | Tritium | ARS1-B14-01354 | 07-16-2014 | W | 82.000 | 78.000 | 120.00 | 80.000 | | 10 | 5.2360 | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine Tree Spring | 2014-3585 | CALA-14-79460 | REG | INIT | RAD | Generic:Low_Level_Tritiu | Tritium | | J- | R12a | Y | 56.8550 | pCi/L | 56.8550 | pCi/L | 1.9500 | 16.9150 | W | 06/18/2014 | | ARS1-B14-01354 | VAL | Y |

| Reason Code | Description |
|---|---|
| R12a | The LCS percent recovery was <the LAL but >10%. Follow the external laboratory limits located within the associated data package. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CALA-14-79460 | Vine Tree Spring | REG | Generic:Low_Level_Tritium | 0 | 1 |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Request Number: 2014-3585

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1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory Request: 2014-3585

# Original COC

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEP

**COC/Lab Request #:** 2014-3585



**Client Contact:**

**Lab Agreement # :** 63641-001-10
**Project Number :**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CALA-14-79460 | Jun 18 2014 | 09:53 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 6/19/14 3:00 | | Jessica Hilliday | 6-20-14 11:00 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory Request: 2014-3585

# Case Narrative

ARS INTERNATIONAL

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July 18, 2014

LANL
Keith Greene
PO Box 1663 MS M992
Los Alamos, NM 87545

Request Number: **2014-3585**
LANL Sample ID: **CALA-14-79460**

Dear Mr. Greene;

On June 20, 2014, ARS International received one (1) water sample to be analyzed for Low Level Tritium.

Sample was counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The client and QA/QC samples were counted with a count time sufficient to meet quality control parameters for counting equipment and were within acceptance criteria and statistical sound detection limits.

If you have any questions please do not hesitate to call at 225.381.2991 or email LANL@amrad.com.

Sincerely,

James D. Pu

Laboratory Management
**ARS International**

ARS INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# COVER PAGE

## PROJECT SAMPLE IDENTIFICATION CROSS-REFERENCE TO ARS SAMPLE LABORATORY IDs

Subcontract (LANL Agreement Number) 250953

| Request Number | LANL PROJECT SAMPLE ID NUMBER | American Radiation Services SAMPLE ID NUMBER(S) |
|---|---|---|
| 2014-3585 | CALA-14-79460 | ARS1-14-01566-001 |

**SAMPLE RECEIPT**

The samples were received in good condition. The samples were screened for radioactive contamination as per procedure **ARS-062 "Sample Receiving"**. A 28-day turnaround was requested on the chain of custody.

**ANALYTICAL METHODS**

Tritium analyses were performed using **ARS-040, "Tritium Assay in Water Samples Using Electrolytic Enrichment".**

**ANALYTICAL RESULTS**

The result data that are flagged with "U" indicate that the activity is below the MDC.

**American Radiation Services Project Manager/Laboratory Director's Comments:**

*"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."*

*"I certify that this electronic image and all hardcopies produced from this image accurately represent the data and are in compliance with the LANL specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."*

| James D. Pu | Laboratory Management, ARS International | 07-18-14 |
|---|---|---|
| **Signature** | **Title** | **Date** |

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# ARS International, LLC

## Laboratory Analysis Report

## ARS1-14-01566

*Prepared for:*

## Los Alamos National Laboratory

**Keith Greene**
**P.O. Box 1663**
**MS M992**
**Los Alamos, NM 87545**
**kgreene@lanl.gov**

**Phone: 505-665-9966**
**Fax: 505-665-9972**

Project Manager Review

Management Review

Notes: ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

**Contact Person: Questions regarding this analytical report should be addressed to:**

**Project Manager**

**ProjectManagers@amrad.com**

**Phone: 225.381.2991**
**Fax: 225.381.2996**

ACLASS ACCREDITED DoD ELAP

**LELAP Cert# 01949**

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

| | | | |
|---|---|---|---|
| **ARS Sample Delivery Group:** | ARS1-14-01566 | **Request or PO Number:** | 2014-3585 |
| **Client Sample ID:** | CALA-14-79460 | **ARS Sample ID:** | ARS1-14-01566-001 |
| **Sample Collection Date:** | 06/18/14 | **Date Received:** | 06/20/14 |
| **Sample Matrix:** | Aqueous | **Report Date:** | 07/18/14 |

| Analysis Description | Analysis Results | CSU +/- 1 s | MDC | DLC | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|---|---|---|---|---|---|---|---|---|---|---|
| Enriched H-3 | 56.855 | 16.915 | 1.950 | 0.941 | | pCi/L | ARS-040 | 07/16/14 01:57 | JPB | NA |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**NOTES: Contract 250953**

Project Manager Review

***Notes:*** *ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself.*
*Reproduction of this report in less than full requires the written consent of ARS International, LLC.*
*The results in this report pertain only to the samples tested and are intended solely for the use of the client.*

LELAP Certificate# 01949

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# QC Results Report

**Sample Delivery Group:** ARS1-14-01566
**Date Received:** 6/20/2014

## Laboratory Control Sample Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Percent Recovery (%) | LCS Acceptance Range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-01354 | LCS | H3 | 20.010 | 3.153 | 2.124 | 24.480 | | pCi/L | ARS-040 | 7/16/14 20:52 | JPB | 82 | 80%-120% |

## Blank Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-01354 | MBL | H3 | 0.778 | 0.579 | 1.876 | NA | U | pCi/L | ARS-040 | 7/16/14 20:52 | JPB |

## Sample RER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | RER | RER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-01354 | LCSD | H3 | 20.010 | 3.153 | 18.989 | 3.016 | | pCi/L | ARS-040 | 7/16/14 20:52 | JPB | 0.17 | < 1 |

## Sample DER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | DER | DER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-01354 | LCSD | H3 | 20.010 | 3.153 | 18.989 | 3.016 | | pCi/L | ARS-040 | 7/16/14 20:52 | JPB | 0.47 | < 3 |

Project Manager Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of ARS International.

LELAP Certificate# 01949 NELAP Certificate # E87558

# QC Evaluation

**EPA Method: ARS-040**
**Batch ID: ARS1-B14-01354**
**SDG's: ARS1-14-01566**

| | | | |
|---|---|---|---|
| **LCS** | 20.0100 | **CSU (2s)** | 6.1800 |
| **LCSD** | 18.9890 | **CSU-D (2s)** | 5.9110 |

**DER =** $\frac{\text{abs(LSC-LSCD)}}{\text{sqr((2s CSU/2)^2)+(( 2s CSU-D/2)^2)}}$ = **< 3**

*at 1 sigma*

**DER** $\frac{1.021}{4.275872}$ = 0.238782 **< 3**

**% RPD=** $\frac{\text{ABS( LCS - LSCD)}}{\text{(LCS+LSCD)/2}}$ * 100 = **< 25%**

**%RPD** $\frac{1.021}{19.4995}$ *100 = 5.236032 **< 25%**

The *RPD* shall be less than 25% or other client-applied criteria

**RER=** $\frac{\text{abs((LCS-LSCD))}}{\text{(CSU)+(CSD)}}$ = **<1** ***<--LANL Requirement***

*at 2 sigma*

**RER =** $\frac{1.021}{12.0910}$ 0.084442974 **<1**

**Blank Information**

| | Act | CSU(2s) | MDA | Act>MDA |
|---|---|---|---|---|
| **AM-241** | | | | |
| **U-234** | | | | |
| **U-235** | | | | |
| **U-238** | | | | |
| **Pu-238** | | | | |
| **Pu-239/240** | | | | |
| **Th-228** | | | | |
| **Th-230** | | | | |
| **Th-232** | | | | |
| **H3** | 0.778 | 1.135 | 1.876 | |
| **Ra-226** | | | | |
| **Ra-228** | | | | |
| **Total U** | | | | |
| **Pb-210** | | | | |
| **Po-209** | | | | |
| **Sr-90** | | | | |
| **TC-99** | | | | |
| **NI-63** | | | | |

*MDA should be below RDL
*Blank activity must be below MDA
*Blank activity must be < 1.65*CSU (DOE only)

ACT = 0.778
CSU = 1.135
Is ACT<1.65*CSU? YES

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-01354**

| Method | ARS-040 | Analysis | LSC-A-022 | Matrix | AQ |
|---|---|---|---|---|---|
| Description | Low Level Tritium by Electrolytic Enrichment | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-01354-01 | LCS | B-16954 | | | | | | | | |
| ARS1-B14-01354-02 | LCSD | B-16955 | | | | | | | | |
| ARS1-B14-01354-03 | MBL | | | | | | | | | |
| ARS1-B14-01354-04 | DUP | | | | | | | | | |
| ARS1-B14-01354-05 | MS | | | | | | | | | |
| ARS1-B14-01354-06 | DO | | | | **ARS1-14-01565** | 001 | 1 | 127-061114-1 | STD | 07/15/14 |
| ARS1-B14-01354-07 | MSO | | | | **ARS1-14-01565** | 002 | 1 | 127-061114-2 | STD | 07/15/14 |
| ARS1-B14-01354-08 | TRG | | | | **ARS1-14-01565** | 003 | 1 | 127-061114-3 | STD | 07/15/14 |
| ARS1-B14-01354-09 | TRG | | | | **ARS1-14-01565** | 004 | 1 | 127-061114-4 | STD | 07/15/14 |
| ARS1-B14-01354-10 | TRG | | | | **ARS1-14-01565** | 005 | 1 | 127-061114-5 | STD | 07/15/14 |
| ARS1-B14-01354-11 | TRG | | | | **ARS1-14-01565** | 006 | 1 | 127-061114-6 | STD | 07/15/14 |
| ARS1-B14-01354-12 | TRG | | | | **ARS1-14-01565** | 007 | 1 | 127-061114-7 | STD | 07/15/14 |
| ARS1-B14-01354-13 | TRG | | | | **ARS1-14-01565** | 008 | 1 | 127-061114-8 | STD | 07/15/14 |
| ARS1-B14-01354-14 | TRG | | | | **ARS1-14-01566** | 001 | 1 | CALA-14-79460 | STD | 07/16/14 |

American Radiation Services
Baton Rouge Laboratory

# LCS Report
## Analytical Batch: ARS1-B14-01354



| BlindID | ABatch | ABatchSampleID | BlindGroup | StdID | Isotope | ExpectedAddition | ExpectedValue | EmptyWt | GrossWt | NetWt | UserID | ModDate | ExpectedValue_CT | MidPointCountDate | KnownValue |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-16954 | ARS1-B14-01354 | ARS1-B14-01354-01 | B-H3 | S-0289 | H-3 | 5 | 2.451504524 | 13.3561 | 18.3686 | 5.0125 | AMRAD\BSTEFFENS | 6/20/2014 | | | |
| B-16955 | ARS1-B14-01354 | ARS1-B14-01354-02 | B-H3 | S-0289 | H-3 | 5 | 2.451504524 | 13.3468 | 18.3621 | 5.0153 | AMRAD\BSTEFFENS | 6/20/2014 | | | |

# ARS-040



| ID_31001_040 | ABatch | AnalysisCode | ABatchSampleID | ClientID | IC_ID | S01_1_EnrichCellNo | S01_2_TareCell |
|---|---|---|---|---|---|---|---|
| 1074 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-01 | | | 0 | 332.2 |
| 1075 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-02 | | | 0 | 331.23 |
| 1076 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-03 | | | 96 | 323.73 |
| 1077 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-04 | | | 0 | 321.05 |
| 1078 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-05 | | | 0 | 339.26 |
| 1079 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-06 | 127-061114-1 | | 48 | 330.33 |
| 1080 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-07 | 127-061114-2 | | 0 | 320.35 |
| 1081 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-08 | 127-061114-3 | | 0 | 332.42 |
| 1082 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-09 | 127-061114-4 | | 54 | 318.93 |
| 1083 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-10 | 127-061114-5 | | 0 | 323.19 |
| 1084 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-11 | 127-061114-6 | | 43 | 320.6 |
| 1085 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-12 | 127-061114-7 | | 0 | 320.63 |
| 1086 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-13 | 127-061114-8 | | 23 | 334.36 |
| 1087 | ARS1-B14-01354 | LSC-A-022 | ARS1-B14-01354-14 | CALA-14-79460 | | 0 | 339.23 |

| S01_3_TareResv | S02_GrossWtResv | S03_1_WtNa2O2 | C_GrossSampleAdded | S04_1_ElectrolSD | S04_2_StartAmp |
|---|---|---|---|---|---|
| 206.71 | 706.72 | 2 | 500.01 | 06/27/2014 11:00:00 | 5 |
| 200.46 | 700.52 | 2.02 | 500.06 | 06/27/2014 11:00:00 | 5 |
| 209.3 | 709.3 | 2 | 500 | 06/27/2014 11:00:00 | 5 |
| 224.46 | 724.5 | 2.02 | 500.04 | 06/27/2014 11:00:00 | 5 |
| 226.19 | 726.19 | 2.02 | 500 | 06/27/2014 11:00:00 | 5 |
| 249.47 | 749.5 | 1.98 | 500.03 | 06/27/2014 11:00:00 | 5 |
| 213.43 | 713.45 | 2 | 500.02 | 06/27/2014 11:00:00 | 5 |
| 199.85 | 699.85 | 2.01 | 500 | 06/27/2014 11:00:00 | 5 |
| 239.44 | 739.45 | 2 | 500.01 | 06/27/2014 11:00:00 | 5 |
| 198.94 | 698.96 | 2 | 500.02 | 06/27/2014 11:00:00 | 5 |
| 208.57 | 408.58 | 2 | 200.01 | 06/27/2014 11:00:00 | 5 |
| 215.24 | 715.27 | 2 | 500.03 | 06/27/2014 11:00:00 | 5 |
| 222.6 | 422.63 | 2.02 | 200.03 | 06/27/2014 11:00:00 | 5 |
| 204.81 | 704.82 | 2 | 500.01 | 06/27/2014 11:00:00 | 5 |

| S04_3_StartBathC | S05_1_ElectrolED | S05_2_EndBathC | S05_3_EndCellWt | C_GrossSmplRec | C_EnrichmentF | S06_TareWt |
|---|---|---|---|---|---|---|
| 2 | 07/15/2014 13:45:00 | 2 | 554.22 | 15.31 | 32.65904637 | 116.83 |
| 2 | 07/14/2014 16:30:00 | 2 | 548.24 | 16.55 | 30.21510574 | 109.73 |
| 2 | 07/15/2014 16:30:00 | 2 | 547.85 | 14.82 | 33.73819163 | 107.09 |
| 2 | 07/14/2014 16:30:00 | 2 | 561.83 | 16.32 | 30.63970588 | 109.36 |
| 2 | 07/14/2014 13:00:00 | 2 | 582.43 | 16.98 | 29.44640754 | 104.86 |
| 2 | 07/14/2014 15:08:00 | 2 | 595 | 15.2 | 32.89671053 | 94.28 |
| 2 | 07/15/2014 14:00:00 | 2 | 549.22 | 15.44 | 32.38471503 | 98.26 |
| 2 | 07/14/2014 10:01:00 | 2 | 548.81 | 16.54 | 30.22974607 | 114.78 |
| 2 | 07/14/2014 11:40:00 | 2 | 575.02 | 16.65 | 30.03063063 | 101.46 |
| 2 | 07/15/2014 16:30:00 | 2 | 538.44 | 16.31 | 30.65726548 | 95.1 |
| 2 | 07/15/2014 14:10:00 | 2 | 545.03 | 15.86 | 12.610971 | 108.29 |
| 2 | 07/15/2014 16:40:00 | 2 | 552.32 | 16.45 | 30.39696049 | 108.16 |
| 2 | 07/15/2014 12:00:00 | 2 | 573.05 | 16.09 | 12.43194531 | 104.74 |
| 2 | 07/14/2014 16:30:00 | 2 | 559.44 | 15.4 | 32.46818182 | 107.71 |

| S07_GrossWt | C_RecoveredWa | S08_TearWtLSCVial | S09_VialPlusSmpl | C_NetSample | S10_1_WtVislSmplDrWatFill |
|---|---|---|---|---|---|
| 128.12 | 11.29 | 6.46 | 16.46 | 10 | 16.46 |
| 120.47 | 10.74 | 6.47 | 16.49 | 10.02 | 16.49 |
| 117.38 | 10.29 | 6.51 | 16.53 | 10.02 | 0 |
| 120.69 | 11.33 | 6.46 | 16.46 | 10 | 16.46 |
| 117.27 | 12.41 | 6.51 | 16.54 | 10.03 | 16.54 |
| 104.21 | 9.93 | 6.45 | 15.5 | 9.05 | 16.5 |
| 109.24 | 10.98 | 6.4 | 16.42 | 10.02 | 16.42 |
| 126.7 | 11.92 | 6.56 | 16.57 | 10.01 | 16.57 |
| 112.17 | 10.71 | 6.61 | 16.61 | 10 | 16.61 |
| 105.99 | 10.89 | 6.65 | 16.65 | 10 | 0 |
| 120.86 | 12.57 | 6.56 | 16.57 | 10.01 | 16.57 |
| 121.31 | 13.15 | 6.61 | 16.61 | 10 | 0 |
| 117.32 | 12.58 | 6.57 | 16.57 | 10 | 16.57 |
| 118.5 | 10.79 | 6.53 | 16.53 | 10 | 16.53 |

| C_NetDeadWaterAdded | C_TareWtBFCocktail | S10_2_GrossWtVSC | C_NetWtCocktailAdded | UserID |
|---|---|---|---|---|
| 0 | 16.46 | 16.46 | 0 | AMRAD\HHARRINGTON |
| 0 | 16.49 | 26.5 | 10.01 | AMRAD\HHARRINGTON |
| 0 | 16.53 | 26.76 | 10.23 | AMRAD\HHARRINGTON |
| 0 | 16.46 | 26.72 | 10.26 | AMRAD\HHARRINGTON |
| 0 | 16.54 | 26.8 | 10.26 | AMRAD\JBYRD |
| 1 | 16.5 | 26.75 | 10.25 | AMRAD\JBYRD |
| 0 | 16.42 | 26.65 | 10.23 | AMRAD\HHARRINGTON |
| 0 | 16.57 | 26.91 | 10.34 | AMRAD\JBYRD |
| 0 | 16.61 | 26.9 | 10.29 | AMRAD\JBYRD |
| 0 | 16.65 | 26.97 | 10.32 | AMRAD\HHARRINGTON |
| 0 | 16.57 | 26.76 | 10.19 | AMRAD\HHARRINGTON |
| 0 | 16.61 | 27.04 | 10.43 | AMRAD\HHARRINGTON |
| 0 | 16.57 | 27 | 10.43 | AMRAD\HHARRINGTON |
| 0 | 16.53 | 26.79 | 10.26 | AMRAD\HHARRINGTON |

| ModDate |
| --- |
| 07/15/2014 17:31:40 |
| 07/15/2014 14:27:24 |
| 07/16/2014 11:58:28 |
| 07/15/2014 14:37:10 |
| 07/14/2014 18:03:41 |
| 07/14/2014 18:11:04 |
| 07/15/2014 17:36:37 |
| 07/14/2014 14:52:20 |
| 07/14/2014 15:31:34 |
| 07/16/2014 10:57:22 |
| 07/15/2014 17:41:01 |
| 07/16/2014 12:07:18 |
| 07/15/2014 17:46:07 |
| 07/15/2014 14:42:25 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_2\20140714_1831
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_2\20140714_1831\20140714_1831.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_2\20140714_1831\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_2\20140714_1831\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_2.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 240.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

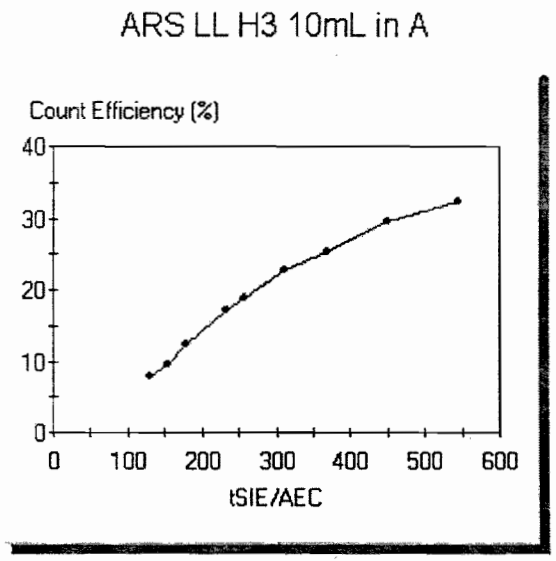
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/22/2013
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 544.56 | 32.36 |
| 451.00 | 29.46 |
| 369.98 | 25.40 |
| 311.75 | 22.73 |
| 257.34 | 18.93 |
| 232.82 | 17.19 |
| 180.53 | 12.39 |
| 154.79 | 9.65 |
| 131.07 | 7.78 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 1 | BACKGROUND | 1.093 | 4.33 | 365.99 | 25.21 | 240.00 | 7/14/2014 | 6:40:38 PM | |
| 11 | 2 | B14-01354-08 | 7.138 | 27.53 | 380.63 | 25.93 | 240.00 | 7/14/2014 | 10:51:32 PM | |
| 11 | 3 | B14-01354-09 | 21.066 | 81.44 | 379.39 | 25.87 | 240.00 | 7/15/2014 | 3:02:32 AM | |
| 11 | 4 | B14-01354-05 | 3.550 | 13.55 | 386.10 | 26.21 | 240.00 | 7/15/2014 | 7:13:41 AM | |
| 11 | 5 | B14-01354-06 | 13.042 | 50.20 | 381.54 | 25.98 | 240.00 | 7/15/2014 | 11:24:35 AM | |
| 11 | 6 | B14-01354-02 | 3.841 | 14.64 | 386.81 | 26.24 | 240.00 | 7/15/2014 | 3:35:31 PM | |
| 11 | 7 | B14-01354-04 | 14.391 | 56.63 | 370.28 | 25.41 | 240.00 | 7/15/2014 | 7:46:26 PM | |
| 11 | 8 | B14-01354-14 | 10.575 | 40.95 | 378.56 | 25.83 | 240.00 | 7/15/2014 | 11:57:25 PM | |
| 11 | 9 | B14-01354-06 11 | 16.766 | 65.64 | 372.90 | 25.54 | 240.00 | 7/16/2014 | 4:08:32 AM | |
| 11 | 10 | B14-01354-11 07 | 1.236 | 4.82 | 374.46 | 25.62 | 240.00 | 7/16/2014 | 8:19:31 AM | |
| 11 | 11 | B14-01354-07 10 | 1.187 | 4.50 | 389.39 | 26.37 | 240.00 | 7/16/2014 | 12:30:25 PM | |
| 11 | 12 | B14-01354-10 01 | 4.157 | 16.26 | 373.50 | 25.57 | 240.00 | 7/16/2014 | 4:41:15 PM | |
| 11 | 13 | B14-01354-01 03 | 1.228 | 4.80 | 373.72 | 25.58 | 240.00 | 7/16/2014 | 8:52:16 PM | |
| 11 | 14 | B14-01354-12 | 1.246 | 4.86 | 374.97 | 25.65 | 240.00 | 7/17/2014 | 1:03:07 AM | |

JB 7-18-14

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20140717_0505
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20140717_0505\20140717_0505.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20140717_0505\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20140717_0505\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 240.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

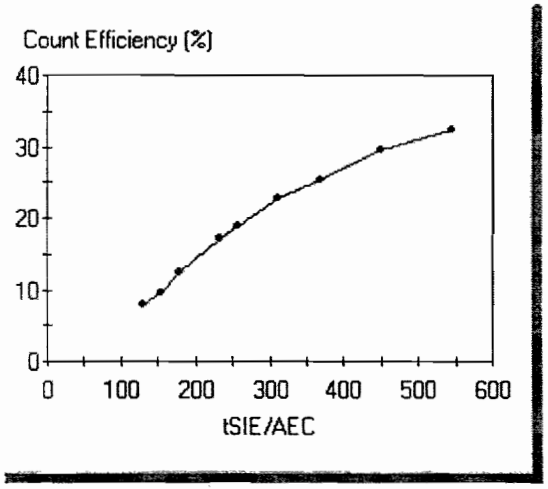
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/22/2013
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 544.56 | 32.36 |
| 451.00 | 29.46 |
| 369.98 | 25.40 |
| 311.75 | 22.73 |
| 257.34 | 18.93 |
| 232.82 | 17.19 |
| 180.53 | 12.39 |
| 154.79 | 9.65 |
| 131.07 | 7.78 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | B14-01354-13 | 15.725 | 59.27 | 392.56 | 26.53 | 240.00 | 7/17/2014 | 5:15:00 AM | |

# LSC Instrument Data Transfer Report

\\Packard3170\Results\H3 Low Level\Low Level H3\2

| Batch Sample ID | Non-BKG Samples Transferred | Samples Eligible To Save | |
|---|---|---|---|
| ARS1-B14-01354 | 14 | 14 | LSC 1 |

| LIMS Batch Sample ID | LSC P# | LSC PTD | LSC S# | LSC SMPL_ID | LSC Count Date | LSC CPMA | LSC tSTE | LSC EFF | LSC Count Dur | Analysis Batch | LIMS SDG | LIMS Run |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BKG | 11 | | 1 | BACKGROUND | 07/14/14 18:40 | 1.09 | 365.99 | 25.2100 | 240.00 | ARS1-B14-01354 | | |
| ARS1-B14-01354-01 | 11 | | 12 | B14-01354-01 | 07/16/14 16:41 | 4.16 | 373.50 | 25.5700 | 240.00 | ARS1-B14-01354 | | |
| ARS1-B14-01354-02 | 11 | | 6 | B14-01354-02 | 07/15/14 15:35 | 3.84 | 386.81 | 26.2400 | 240.00 | ARS1-B14-01354 | | |
| ARS1-B14-01354-03 | 11 | | 13 | B14-01354-03 | 07/16/14 20:52 | 1.23 | 373.72 | 25.5800 | 240.00 | ARS1-B14-01354 | | |
| ARS1-B14-01354-04 | 11 | | 7 | B14-01354-04 | 07/15/14 19:46 | 14.39 | 370.28 | 25.4100 | 240.00 | ARS1-B14-01354 | | |
| ARS1-B14-01354-05 | 11 | | 4 | B14-01354-05 | 07/15/14 07:13 | 3.55 | 386.10 | 26.2100 | 240.00 | ARS1-B14-01354 | | |
| ARS1-B14-01354-06 | 11 | | 5 | B14-01354-06 | 07/15/14 11:24 | 13.04 | 381.54 | 25.9800 | 240.00 | ARS1-B14-01354 | ARS1-14-01565 | 1 |
| ARS1-B14-01354-07 | 11 | | 10 | B14-01354-07 | 07/16/14 08:19 | 1.24 | 374.46 | 25.6200 | 240.00 | ARS1-B14-01354 | ARS1-14-01565 | 1 |
| ARS1-B14-01354-08 | 11 | | 2 | B14-01354-08 | 07/14/14 22:51 | 7.14 | 380.63 | 25.9300 | 240.00 | ARS1-B14-01354 | ARS1-14-01565 | 1 |
| ARS1-B14-01354-09 | 11 | | 3 | B14-01354-09 | 07/15/14 03:02 | 21.07 | 379.39 | 25.8700 | 240.00 | ARS1-B14-01354 | ARS1-14-01565 | 1 |
| ARS1-B14-01354-10 | 11 | | 11 | B14-01354-10 | 07/16/14 12:30 | 1.19 | 389.39 | 26.3700 | 240.00 | ARS1-B14-01354 | ARS1-14-01565 | 1 |
| ARS1-B14-01354-11 | 11 | | 9 | B14-01354-11 | 07/16/14 04:08 | 16.77 | 372.90 | 25.5400 | 240.00 | ARS1-B14-01354 | ARS1-14-01565 | 1 |
| ARS1-B14-01354-12 | 11 | | 14 | B14-01354-12 | 07/17/14 01:03 | 1.25 | 374.97 | 25.6500 | 240.00 | ARS1-B14-01354 | ARS1-14-01565 | 1 |
| ARS1-B14-01354-14 | 11 | | 8 | B14-01354-14 | 07/15/14 23:57 | 10.58 | 378.56 | 25.8300 | 240.00 | ARS1-B14-01354 | ARS1-14-01566 | 1 |
| ARS1-B14-01354-13 | 2 | | 1 | B14-01354-13 | 07/17/14 05:15 | 15.73 | 392.56 | 26.5300 | 240.00 | ARS1-B14-01354 | ARS1-14-01565 | 1 |

## ARS-040 Calculation Results

### ARS1-B14-01354

| | |
|---|---|
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Initial_Mass_sample_g | Mass_Na2O2_added_g | Final_mass_electrolyzed_sample_NaOH_g | Mass_equivalent_NaOH_g | Final_Mass_Electrolyzed_sample_g | VolumeFactor_X | Enrichment_Factor_Y |
|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-01354-01 | 500.010 | 2.000 | 15.310 | 2.052 | 13.258 | 0.027 | 29.400 |
| LSC-A-022 | ARS1-B14-01354-02 | 500.060 | 2.020 | 16.550 | 2.073 | 14.477 | 0.029 | 27.019 |
| LSC-A-022 | ARS1-B14-01354-03 | 500.000 | 2.000 | 14.820 | 2.052 | 12.768 | 0.026 | 30.484 |
| LSC-A-022 | ARS1-B14-01354-04 | 500.040 | 2.020 | 16.320 | 2.073 | 14.247 | 0.028 | 27.437 |
| LSC-A-022 | ARS1-B14-01354-05 | 500.000 | 2.020 | 16.980 | 2.073 | 14.907 | 0.030 | 26.266 |
| LSC-A-022 | ARS1-B14-01354-06 | 500.030 | 1.980 | 15.200 | 2.031 | 13.169 | 0.026 | 29.594 |
| LSC-A-022 | ARS1-B14-01354-07 | 500.020 | 2.000 | 15.440 | 2.052 | 13.388 | 0.027 | 29.127 |
| LSC-A-022 | ARS1-B14-01354-08 | 500.000 | 2.010 | 16.540 | 2.062 | 14.478 | 0.029 | 27.015 |
| LSC-A-022 | ARS1-B14-01354-09 | 500.010 | 2.000 | 16.650 | 2.052 | 14.598 | 0.029 | 26.802 |
| LSC-A-022 | ARS1-B14-01354-10 | 500.020 | 2.000 | 16.310 | 2.052 | 14.258 | 0.029 | 27.416 |
| LSC-A-022 | ARS1-B14-01354-11 | 200.010 | 2.000 | 15.860 | 2.052 | 13.808 | 0.069 | 11.720 |
| LSC-A-022 | ARS1-B14-01354-12 | 500.030 | 2.000 | 16.450 | 2.052 | 14.398 | 0.029 | 27.161 |
| LSC-A-022 | ARS1-B14-01354-13 | 200.030 | 2.020 | 16.090 | 2.073 | 14.017 | 0.070 | 11.553 |
| LSC-A-022 | ARS1-B14-01354-14 | 500.010 | 2.000 | 15.400 | 2.052 | 13.348 | 0.027 | 29.210 |

## ARS-040 Calculation Results

### ARS1-B14-01354

| | |
|---|---|
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Average_Sample_CPM | Bkg_CPM | tSIE | Detector_Eff_decimal | Aliquot | AliqUnits | Activity_reference_date | Start_Date_of_Count | Sample_Count_Duration_min |
|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-01354-01 | 4.157 | 1.093 | 373.500 | 0.256 | 0.01000 | L | 1/3/2013 | 7/16/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-02 | 3.841 | 1.093 | 386.810 | 0.262 | 0.01002 | L | 1/3/2013 | 7/15/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-03 | 1.228 | 1.093 | 373.720 | 0.256 | 0.01002 | L | 7/16/2014 | 7/16/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-04 | 14.391 | 1.093 | 370.280 | 0.254 | 0.01000 | L | 6/11/2014 | 7/15/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-05 | 3.550 | 1.093 | 386.100 | 0.262 | 0.01003 | L | 6/11/2014 | 7/15/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-06 | 13.042 | 1.093 | 381.540 | 0.260 | 0.00905 | L | 6/11/2014 | 7/15/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-07 | 1.236 | 1.093 | 374.460 | 0.256 | 0.01002 | L | 6/11/2014 | 7/16/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-08 | 7.138 | 1.093 | 380.630 | 0.259 | 0.01001 | L | 6/11/2014 | 7/14/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-09 | 21.066 | 1.093 | 379.390 | 0.259 | 0.01000 | L | 6/11/2014 | 7/15/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-10 | 1.187 | 1.093 | 389.390 | 0.264 | 0.01000 | L | 6/11/2014 | 7/16/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-11 | 16.766 | 1.093 | 372.900 | 0.255 | 0.01001 | L | 6/11/2014 | 7/16/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-12 | 1.246 | 1.093 | 374.970 | 0.257 | 0.01000 | L | 6/11/2014 | 7/17/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-13 | 15.725 | 1.093 | 392.560 | 0.265 | 0.01000 | L | 6/11/2014 | 7/17/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-01354-14 | 10.575 | 1.093 | 378.560 | 0.258 | 0.01000 | L | 6/18/2014 | 7/15/2014 | 240.000 |

## ARS-040 Calculation Results

### ARS1-B14-01354

| | |
|---|---|
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Total_Bkg_Count_Duration_min | DF | Sample_Activity_Conc | Standard_Counting_Uncertainty | CU_1 | CSU_1 | CU_1_96 | CSU_1_96 | MDC | DLC | ActivityReportUnits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-01354-01 | 240.000 | 0.91750 | 20.010 | 0.966 | 0.966 | 3.153 | 1.893 | 6.180 | 2.124 | 1.025 | pCi |
| LSC-A-022 | ARS1-B14-01354-02 | 240.000 | 0.91764 | 18.989 | 0.991 | 0.991 | 3.016 | 1.942 | 5.911 | 2.248 | 1.085 | pCi |
| LSC-A-022 | ARS1-B14-01354-03 | 240.000 | 0.99985 | 0.778 | 0.567 | 0.567 | 0.579 | 1.111 | 1.135 | 1.876 | 0.905 | pCi |
| LSC-A-022 | ARS1-B14-01354-04 | 240.000 | 0.99478 | 86.371 | 1.650 | 1.650 | 13.060 | 3.234 | 25.598 | 2.113 | 1.020 | pCi |
| LSC-A-022 | ARS1-B14-01354-05 | 240.000 | 0.99478 | 16.112 | 0.912 | 0.912 | 2.583 | 1.788 | 5.063 | 2.133 | 1.030 | pCi |
| LSC-A-022 | ARS1-B14-01354-06 | 240.000 | 0.99478 | 77.762 | 1.579 | 1.579 | 11.771 | 3.096 | 23.071 | 2.117 | 1.022 | pCi |
| LSC-A-022 | ARS1-B14-01354-07 | 240.000 | 0.99462 | 0.866 | 0.597 | 0.597 | 0.611 | 1.169 | 1.197 | 1.970 | 0.951 | pCi |
| LSC-A-022 | ARS1-B14-01354-08 | 240.000 | 0.99478 | 39.037 | 1.196 | 1.196 | 5.976 | 2.344 | 11.714 | 2.101 | 1.014 | pCi |
| LSC-A-022 | ARS1-B14-01354-09 | 240.000 | 0.99478 | 130.438 | 1.984 | 1.984 | 19.666 | 3.889 | 38.545 | 2.124 | 1.025 | pCi |
| LSC-A-022 | ARS1-B14-01354-10 | 240.000 | 0.99462 | 0.589 | 0.611 | 0.611 | 0.617 | 1.197 | 1.209 | 2.038 | 0.983 | pCi |
| LSC-A-022 | ARS1-B14-01354-11 | 240.000 | 0.99462 | 236.889 | 4.123 | 4.123 | 35.772 | 8.081 | 70.113 | 4.916 | 2.373 | pCi |
| LSC-A-022 | ARS1-B14-01354-12 | 240.000 | 0.99447 | 0.995 | 0.642 | 0.642 | 0.659 | 1.258 | 1.292 | 2.115 | 1.021 | pCi |
| LSC-A-022 | ARS1-B14-01354-13 | 240.000 | 0.99447 | 216.234 | 3.912 | 3.912 | 32.670 | 7.668 | 64.034 | 4.807 | 2.320 | pCi |
| LSC-A-022 | ARS1-B14-01354-14 | 240.000 | 0.99570 | 56.855 | 1.322 | 1.322 | 8.630 | 2.591 | 16.915 | 1.950 | 0.941 | pCi |

## ARS-040 Calculation Results

### ARS1-B14-01354

| | |
|---|---|
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | AliquotReportUnits | UserID | ModDate |
|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-01354-01 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-02 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-03 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-04 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-05 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-06 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-07 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-08 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-09 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-10 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-11 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-12 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-13 | L | AMRAD\JBYRD | 7/18/2014 |
| LSC-A-022 | ARS1-B14-01354-14 | L | AMRAD\JBYRD | 7/18/2014 |

**ARS Batch Number:** ARS1-B14 - 01354

| Enter these Values for LCS | | | |
|---|---|---|---|
| | Current ACT | 5.4223 | Standards Report |
| | NetWt | 5.0125 | LCS Report |
| | Aliquot | 0.5000 | Procedural Data Report |

| Enter these Values for LCSD | | | |
|---|---|---|---|
| | Current ACT | 5.4223 | Standards Report |
| | NetWt | 5.0153 | LCS Report |
| | Aliquot | 0.5001 | Procedural Data Report |

## Expected Value Calculations

**ARS Batch Number:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **LCS** | **CALCULATED EXPECTED VALUE** | = | 24.4853 | | | |
| | | | **Range** | 18.3640 | - | 30.6067 |
| **LCSD** | **CALCULATED EXPECTED VALUE** | = | 24.4966 | | | |
| | | | **Range** | 18.3724 | - | 30.6207 |

# Standards Activity as of: 07/14/14 17:30

| Active | Std ID | Isotope | PSCLT | Verification Date | Exp Date | Status | Ref Date | Ref ACT (dpm) | ACT at Date Above (dpm/g) | Halflife (days) | Parent ID | Expended Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | **S-0289** | H-3 | **SL** | 01/07/14 | 01/07/15 | OK | 01/03/13 | 5.9080E+00 | **5.4223** | 4.500E+03 | **S-0237** | |

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Tech Ini |
|---|---|---|---|---|---|
| 7-3-14 | 1854 | B14-01420-04 | B14-01420 | 2039 | |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | |
| 7-14-14 | 10:28 | SNC16 | QA | QA | |
| 7-14-14 | 10:56 | Background ~~B14-01467-04~~ | 7-14-14 B14-01467 | 1201 | |
| ↓ | ↓ | ↓ ~~-05~~ -04 | B14-01467 | ↓ | |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | |
| ↓ | 17:30 | Background | B14-01354 | 1831 | |
| ↓ | ↓ | B14-01354-08 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 09 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 05 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 06 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 02 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 04 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 14 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 06 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 11 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 7 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 10 | ↓ | ↓ | |
| ↓ | ↓ | ↓ 01 | ↓ | ↓ | |



Reviewed By: SOA Date: 7-18-14
Initials

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 7-14-14 | 17:30 | B14-01354-02 | B14-01354 | ↓ | JB |
| ↓ | ↓ | ↓ -03 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -13 | ↓ | 0505 | JB |
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SOh 7-18-14

Page 123 of 200
CE-13

Reviewed By: SOh Date: 7-18-14
Initials

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

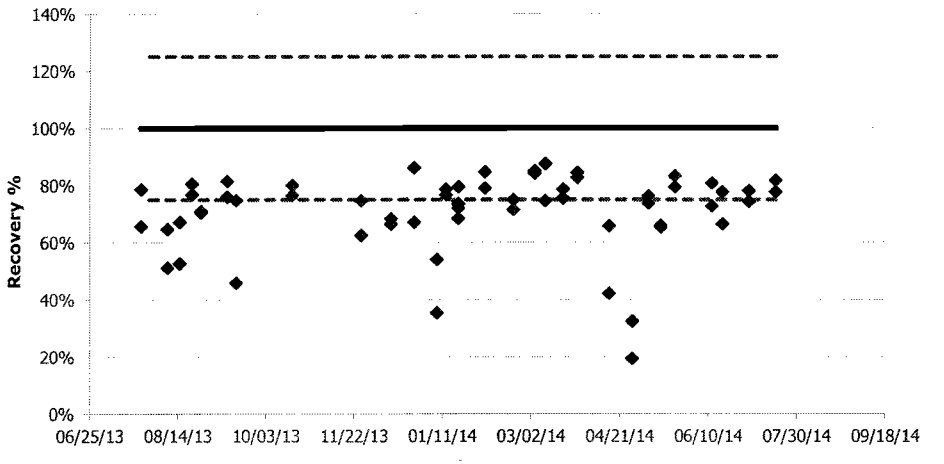
# Control Charts

American Radiation Services
Baton Rouge Laboratory

# QC Chart

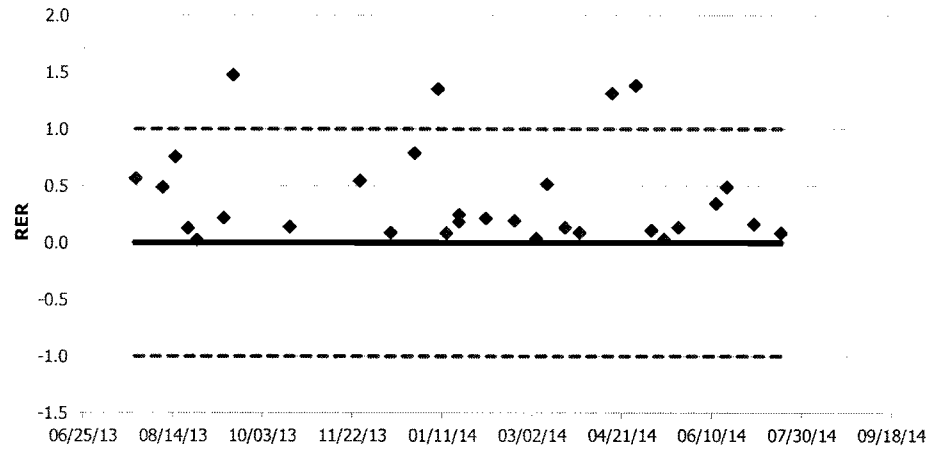


## LLH-3 LCS



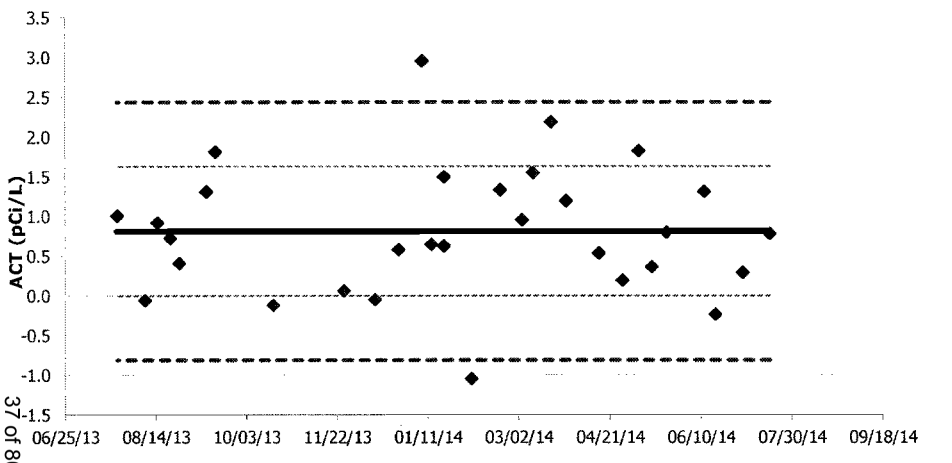

| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.7090 | 0.1367 | 30 | 1.2500 | 0.7500 |

## LLH-3 RER



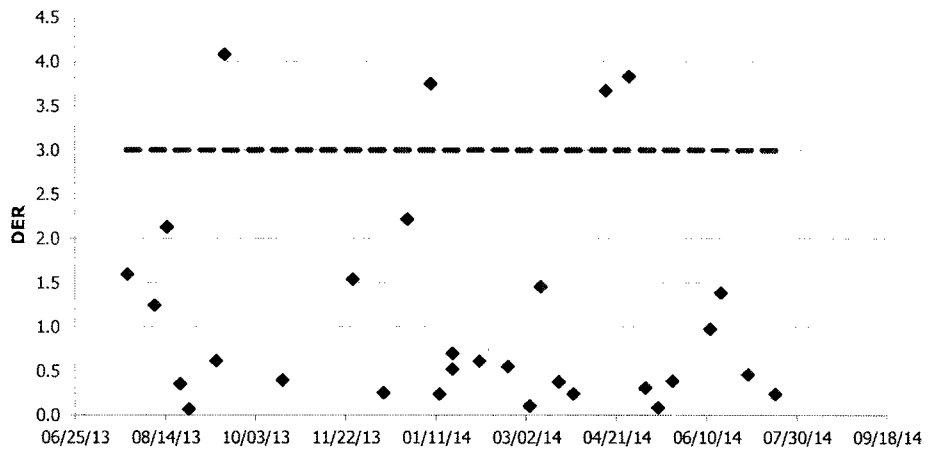

| | | n | UCL | LCL |
|---|---|---|---|---|
| | | 30 | 1.0000 | -1.0000 |

## LLH-3 Blank




| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.8115 | 0.8128 | 30 | 2.4370 | -0.8141 |

## LLH-3 DER



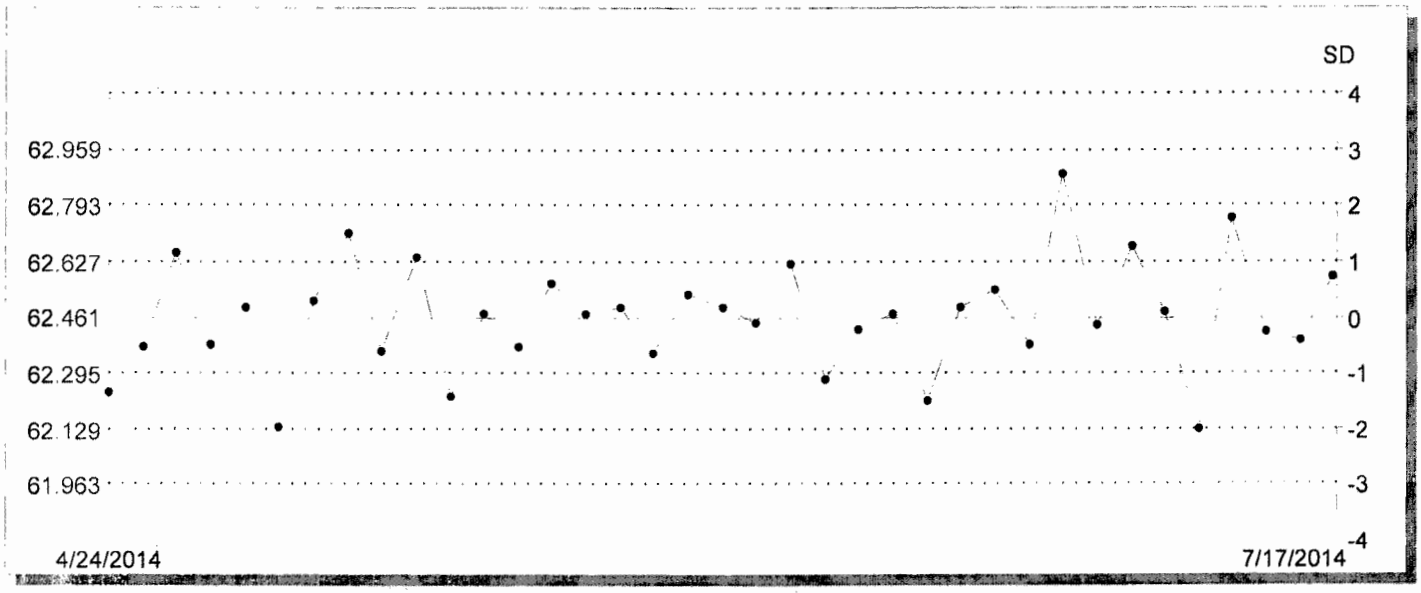

| | | n | UCL | |
|---|---|---|---|---|
| | | 30 | 3.0000 | |

3H Efficiency
Total # pts : 5895
Valid # pts : 37
Mean : 62.46
SD : 0.17

| Date | Value | Valid Pt |
|---|---|---|
| Apr 24, 2014 | 62.24 | X |
| Apr 25, 2014 | 62.37 | X |
| Apr 28, 2014 | 62.65 | X |
| Apr 30, 2014 | 62.38 | X |
| May 02, 2014 | 62.49 | X |
| May 02, 2014 | 62.13 | X |
| May 05, 2014 | 62.51 | X |
| May 06, 2014 | 62.71 | X |
| May 07, 2014 | 62.36 | X |
| May 09, 2014 | 62.64 | X |
| May 09, 2014 | 62.23 | X |
| May 09, 2014 | 62.47 | X |
| May 10, 2014 | 62.37 | X |
| May 14, 2014 | 62.56 | X |
| May 14, 2014 | 62.47 | X |
| May 16, 2014 | 62.49 | X |
| May 20, 2014 | 62.35 | X |
| May 21, 2014 | 62.53 | X |
| May 22, 2014 | 62.49 | X |
| May 22, 2014 | 62.44 | X |
| Jun 06, 2014 | 62.62 | X |
| Jun 09, 2014 | 62.27 | X |
| Jun 10, 2014 | 62.42 | X |
| Jun 10, 2014 | 62.47 | X |
| Jun 12, 2014 | 62.21 | X |
| Jun 13, 2014 | 62.49 | X |
| Jun 16, 2014 | 62.54 | X |
| Jun 18, 2014 | 62.38 | X |
| Jun 23, 2014 | 62.88 | X |
| Jun 23, 2014 | 62.44 | X |
| Jun 24, 2014 | 62.67 | X |
| Jun 27, 2014 | 62.47 | X |
| Jul 01, 2014 | 62.13 | X |
| Jul 03, 2014 | 62.76 | X |
| Jul 03, 2014 | 62.42 | X |
| Jul 14, 2014 | 62.39 | X |
| Jul 17, 2014 | 62.58 | X |

3H Efficiency

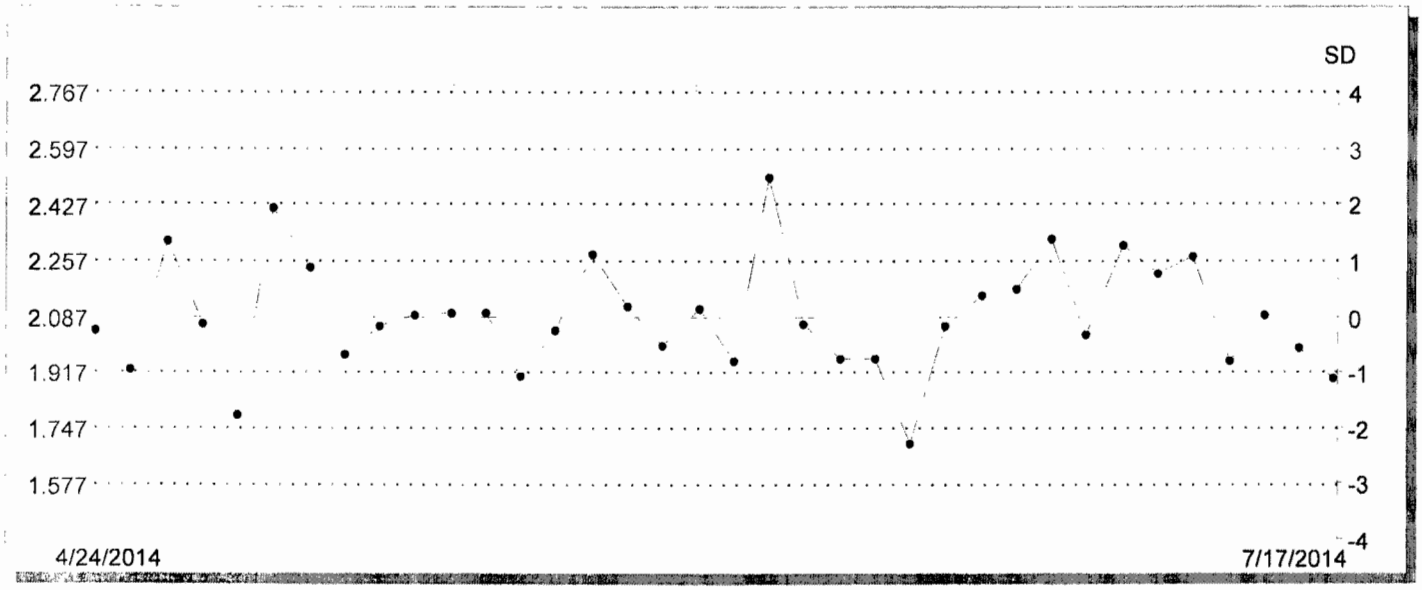
| | |
|---|---|
| Total # pts | : 5895 |
| Valid # pts | : 37 |
| Mean | : 62.46 |
| SD | : 0.17 |



3H Background
Total # pts : 5820
Valid # pts : 36
Mean : 2.09
SD : 0.17

| Date | Value | Valid Pt |
|---|---|---|
| Apr 24, 2014 | 2.05 | X |
| Apr 25, 2014 | 1.93 | X |
| Apr 28, 2014 | 2.32 | X |
| Apr 30, 2014 | 2.07 | X |
| May 02, 2014 | 1.79 | X |
| May 02, 2014 | 2.42 | X |
| May 05, 2014 | 2.24 | X |
| May 06, 2014 | 1.98 | X |
| May 07, 2014 | 2.06 | X |
| May 09, 2014 | 2.09 | X |
| May 09, 2014 | 2.10 | X |
| May 09, 2014 | 2.10 | X |
| May 10, 2014 | 1.90 | X |
| May 14, 2014 | 2.04 | X |
| May 14, 2014 | 2.28 | X |
| May 16, 2014 | 2.12 | X |
| May 20, 2014 | 2.00 | X |
| May 21, 2014 | 2.11 | X |
| May 22, 2014 | 1.95 | X |
| Jun 06, 2014 | 2.51 | X |
| Jun 09, 2014 | 2.07 | X |
| Jun 10, 2014 | 1.96 | X |
| Jun 10, 2014 | 1.96 | X |
| Jun 12, 2014 | 1.70 | X |
| Jun 13, 2014 | 2.06 | X |
| Jun 16, 2014 | 2.15 | X |
| Jun 18, 2014 | 2.17 | X |
| Jun 23, 2014 | 2.33 | X |
| Jun 23, 2014 | 2.03 | X |
| Jun 24, 2014 | 2.30 | X |
| Jun 27, 2014 | 2.22 | X |
| Jul 01, 2014 | 2.27 | X |
| Jul 03, 2014 | 1.95 | X |
| Jul 03, 2014 | 2.09 | X |
| Jul 14, 2014 | 2.00 | X |
| Jul 17, 2014 | 1.90 | X |

3H Background
Total # pts : 5820
Valid # pts : 36
Mean : 2.09
SD : 0.17



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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium- Screening by Low Level Liquid Scintillation Counting

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting Samples

***Procedures:*** **ARS-060** **ARS-040** *Section 14.1 Tritium Screen in Clean Water without Distillation*

***ARS File ID Numbers:*** ARS1-14-01565; 1566
***ARS Batch ID:*** ARS1-B14-01326

| | Sample ID: | COUNT TIME | CPMA | Background CPMA | Eff Nucl In A | Aliquot (grams) | ACTIVITY | units | MDA | Sample Must be analyzed as LSC-A-001 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | B14-01326-04 | 120 | 1.539 | 1.259 | 27.65 | 10.02 | 45.524 | pCi/L | 98.71864 | NO |
| 2 | B14-01326-05 | 120 | 1.147 | 1.259 | 28.64 | 10.02 | -17.580 | pCi/L | 95.30623 | NO |
| 3 | B14-01326-06 | 120 | 1.289 | 1.259 | 26.6 | 10.01 | 5.075 | pCi/L | 102.7179 | NO |
| 4 | B14-01326-07 | 120 | 1.738 | 1.259 | 26.64 | 10.02 | 80.831 | pCi/L | 102.4614 | NO |
| 5 | B14-01326-08 | 120 | 1.246 | 1.259 | 28.24 | 10.02 | -2.069 | pCi/L | 96.65618 | NO |
| 6 | B14-01326-09 | 120 | 2.541 | 1.259 | 27.64 | 10.02 | 208.511 | pCi/L | 98.75436 | YES, analyze by LSC-A-001. |
| 7 | B14-01326-10 | 120 | 1.270 | 1.259 | 28.64 | 10.03 | 1.725 | pCi/L | 95.21121 | NO |
| 8 | B14-01326-11 | 120 | 2.238 | 1.259 | 27.72 | 10.03 | 158.612 | pCi/L | 98.37118 | YES, analyze by LSC-A-001. |
| 9 | B14-01326-12 | 120 | 1.433 | 1.259 | 28.36 | 10.04 | 27.527 | pCi/L | 96.05547 | NO |
| 10 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 11 | B14-01326-09 recount | 120 | 2.298 | 1.121 | 25.63 | 10.02 | 206.446 | pCi/L | 100.7164 | YES, analyze by LSC-A-001. |
| 12 | B14-01326-11 recount | 120 | 2.342 | 1.121 | 25.25 | 10.03 | 217.170 | pCi/L | 102.1302 | YES, analyze by LSC-A-001. |
| 13 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 14 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 15 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 16 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 17 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 18 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 19 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 20 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 21 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 22 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 23 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |

per Jimmy, run 1565-006; 1565-008 with reduced volume (200ml)

***Procedures:*** **ARS-060** **ARS-040** *Section 14.1 Tritium Screen in Clean Water without Distillation*

***ARS File ID Numbers:*** ARS1-14-01565; 1566
***ARS Batch ID:*** ARS1-B14-01326

| | Sample ID: | COUNT TIME | CPMA | Background CPMA | Eff Nucl In A | Aliquot (grams) | ACTIVITY | units | MDA | Sample Must be analyzed as LSC-A-001 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | B14-01326-04 | 120 | 1.539 | 1.259 | 27.65 | 10.02 | 45.524 | pCi/L | 98.71864 | NO |
| 2 | B14-01326-05 | 120 | 1.147 | 1.259 | 28.64 | 10.02 | -17.580 | pCi/L | 95.30623 | NO |
| 3 | B14-01326-06 | 120 | 1.289 | 1.259 | 26.6 | 10.01 | 5.075 | pCi/L | 102.7179 | NO |
| 4 | B14-01326-07 | 120 | 1.738 | 1.259 | 26.64 | 10.02 | 80.831 | pCi/L | 102.4614 | NO |
| 5 | B14-01326-08 | 120 | 1.246 | 1.259 | 28.24 | 10.02 | -2.069 | pCi/L | 96.65618 | NO |
| 6 | B14-01326-09 | 120 | 2.541 | 1.259 | 27.64 | 10.02 | 208.511 | pCi/L | 98.75436 | YES, analyze by LSC-A-001. |
| 7 | B14-01326-10 | 120 | 1.270 | 1.259 | 28.64 | 10.03 | 1.725 | pCi/L | 95.21121 | NO |
| 8 | B14-01326-11 | 120 | 2.238 | 1.259 | 27.72 | 10.03 | 158.612 | pCi/L | 98.37118 | YES, analyze by LSC-A-001. |
| 9 | B14-01326-12 | 120 | 1.433 | 1.259 | 28.36 | 10.04 | 27.527 | pCi/L | 96.05547 | NO |
| 10 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 11 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 12 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 13 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 14 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 15 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 16 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 17 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 18 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 19 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 20 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 21 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 22 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 23 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



INTERNATIONAL

**Analysis Batch ID** **ARS1-B14-01326**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Method** | **ARS-054** | **Analysis** | | **LSC-A-021** | **Matrix** | **AQ** |
| | | | | **Description** | **Low Level Tritium Screening** | | | | | |
| **ABatch Sample ID** | **Type** | **Blind Iso1** | **Blind Iso2** | **Blind Iso3** | **SDG** | **FR** | **Run** | **Client ID** | **Isotope Group** | **Lab Deadline** |
| ARS1-B14-01326-01 | LCS | | | | | | | | | |
| ARS1-B14-01326-02 | LCSD | | | | | | | | | |
| ARS1-B14-01326-03 | MBL | | | | | | | | | |
| ARS1-B14-01326-04 | TRG | | | | **ARS1-14-01565** | 001 | 1 | 127-061114-1 | STD | 07/15/14 |
| ARS1-B14-01326-05 | TRG | | | | **ARS1-14-01565** | 002 | 1 | 127-061114-2 | STD | 07/15/14 |
| ARS1-B14-01326-06 | TRG | | | | **ARS1-14-01565** | 003 | 1 | 127-061114-3 | STD | 07/15/14 |
| ARS1-B14-01326-07 | TRG | | | | **ARS1-14-01565** | 004 | 1 | 127-061114-4 | STD | 07/15/14 |
| ARS1-B14-01326-08 | TRG | | | | **ARS1-14-01565** | 005 | 1 | 127-061114-5 | STD | 07/15/14 |
| ARS1-B14-01326-09 | TRG | | | | **ARS1-14-01565** | 006 | 1 | 127-061114-6 | STD | 07/15/14 |
| ARS1-B14-01326-10 | TRG | | | | **ARS1-14-01565** | 007 | 1 | 127-061114-7 | STD | 07/15/14 |
| ARS1-B14-01326-11 | TRG | | | | **ARS1-14-01565** | 008 | 1 | 127-061114-8 | STD | 07/15/14 |
| ARS1-B14-01326-12 | TRG | | | | **ARS1-14-01566** | 001 | 1 | CALA-14-79460 | STD | 07/16/14 |

# ARS-054



| ID_31001_054 | ABatch | ABatchSampleID | ClientID | Aliquot1 | AliquotUnits1 | IC_ID1 | Aliquot2 | AliquotUnits2 | IC_ID2 | UserID | ModDate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 13784 | ARS1-B14-01326 | ARS1-B14-01326-01 | | 1 | g | | | | | AMRAD\JBYRD | 06/23/2014 16:11:47 |
| 13785 | ARS1-B14-01326 | ARS1-B14-01326-02 | | 1 | g | | | | | AMRAD\JBYRD | 06/23/2014 16:11:47 |
| 13786 | ARS1-B14-01326 | ARS1-B14-01326-03 | | 1 | g | | | | | AMRAD\JBYRD | 06/23/2014 16:11:48 |
| 13787 | ARS1-B14-01326 | ARS1-B14-01326-04 | 127-061114-1 | 10.02 | g | 164967 | | | | AMRAD\JBYRD | 06/23/2014 16:11:48 |
| 13788 | ARS1-B14-01326 | ARS1-B14-01326-05 | 127-061114-2 | 10.02 | g | 164968 | | | | AMRAD\JBYRD | 06/23/2014 16:11:48 |
| 13789 | ARS1-B14-01326 | ARS1-B14-01326-06 | 127-061114-3 | 10.01 | g | 164969 | | | | AMRAD\JBYRD | 06/23/2014 16:11:48 |
| 13790 | ARS1-B14-01326 | ARS1-B14-01326-07 | 127-061114-4 | 10.02 | g | 164970 | | | | AMRAD\JBYRD | 06/23/2014 16:11:49 |
| 13791 | ARS1-B14-01326 | ARS1-B14-01326-08 | 127-061114-5 | 10.02 | g | 164971 | | | | AMRAD\JBYRD | 06/23/2014 16:11:49 |
| 13792 | ARS1-B14-01326 | ARS1-B14-01326-09 | 127-061114-6 | 10.02 | g | 164972 | | | | AMRAD\JBYRD | 06/23/2014 16:11:49 |
| 13793 | ARS1-B14-01326 | ARS1-B14-01326-10 | 127-061114-7 | 10.03 | g | 164973 | | | | AMRAD\JBYRD | 06/23/2014 16:11:49 |
| 13794 | ARS1-B14-01326 | ARS1-B14-01326-11 | 127-061114-8 | 10.03 | g | 164974 | | | | AMRAD\JBYRD | 06/23/2014 16:11:49 |
| 13795 | ARS1-B14-01326 | ARS1-B14-01326-12 | CALA-14-79460 | 10.04 | g | 164975 | | | | AMRAD\JBYRD | 06/23/2014 16:11:50 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20140623_1757
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20140623_1757\20140623_1757.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20140623_1757\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20140623_1757\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 120.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

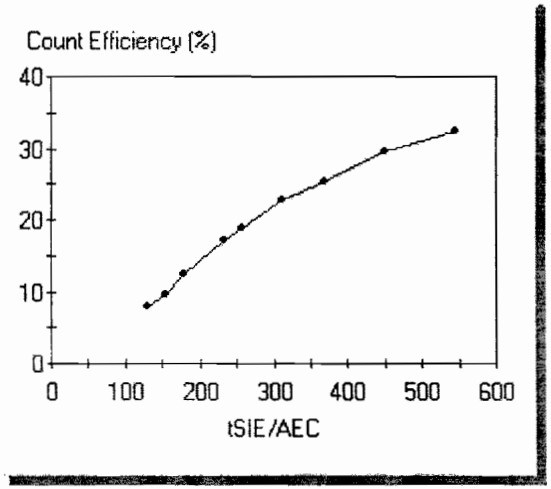
Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data

ARS LL H3 10mL in A




Date Acquired: 08/22/2013
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 544.56 | 32.36 |
| 451.00 | 29.46 |
| 369.98 | 25.40 |
| 311.75 | 22.73 |
| 257.34 | 18.93 |
| 232.82 | 17.19 |
| 180.53 | 12.39 |
| 154.79 | 9.65 |
| 131.07 | 7.78 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 1 | BACKGROUND | 1.259 | 4.65 | 403.85 | 27.10 | 120.00 | 6/23/2014 | 6:05:56 PM | |
| 10 | 2 | B14-01326-04 | 1.539 | 5.57 | 414.78 | 27.65 | 120.00 | 6/23/2014 | 8:15:46 PM | |
| 10 | 3 | B14--01326-05 | 1.147 | 4.00 | 434.55 | 28.64 | 120.00 | 6/23/2014 | 10:25:39 PM | |
| 10 | 4 | B14--01326-06 | 1.289 | 4.85 | 393.98 | 26.60 | 120.00 | 6/24/2014 | 12:35:31 AM | |
| 10 | 5 | B14--01326-07 | 1.738 | 6.52 | 394.72 | 26.64 | 120.00 | 6/24/2014 | 2:45:26 AM | |
| 10 | 6 | B14--01326-08 | 1.246 | 4.41 | 426.52 | 28.24 | 120.00 | 6/24/2014 | 4:55:26 AM | |
| 10 | 7 | B14--01326-09 | 2.541 | 9.19 | 414.72 | 27.64 | 120.00 | 6/24/2014 | 7:05:17 AM | |
| 10 | 8 | B14--01326-10 | 1.270 | 4.43 | 434.65 | 28.64 | 120.00 | 6/24/2014 | 9:15:09 AM | |
| 10 | 9 | B14--01326-11 | 2.238 | 8.07 | 416.31 | 27.72 | 120.00 | 6/24/2014 | 11:24:59 AM | |
| 10 | 10 | B14--01326-12 | 1.433 | 5.05 | 429.11 | 28.36 | 120.00 | 6/24/2014 | 1:34:50 PM | |

## Low Level Tritium pH Checks

| SDG# | Fraction | pH | Date | Analyst |
|---|---|---|---|---|
| ARS1-14-01565 | 001 | 7 | 6-23-14 | [illegible] |
| ↓ | 002 | 7 | ↓ | [illegible] |
| ↓ | 003 | 7 | ↓ | [illegible] |
| ↓ | 004 | 7 | ↓ | [illegible] |
| ↓ | 005 | 7 | ↓ | [illegible] |
| ↓ | 006 | 7 | ↓ | [illegible] |
| ↓ | 007 | 7 | ↓ | [illegible] |
| ↓ | 008 | 7 | ↓ | [illegible] |
| ARS1-14-01566 | 001 | 7 | ↓ | [illegible] |
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ARS-040-001.r0

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 6-13-14 | 16.03 | BIH-01267-07 | BIH 01267 | ↓ | [illegible] |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -09 | ↓ | ↓ | [illegible] |
| 6-17-14 03 6-16-14 | 8:50 | SNC16 | QA | QA | [illegible] |
| ~~6-17-14~~ | ↓ | Background | BIH-01173 | 1311 | [illegible] |
| ↓ | ↓ | BIH-01173 -02 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 03 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 05 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 04 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 08 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 01 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 06 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 07 | ↓ | ↓ | [illegible] |
| 6-23-14 | [illegible] | SNC16 | QA | QA | [illegible] |
| ↓ | ↓ | Background | BIH-01326 | 1757 | [illegible] |
| ↓ | ↓ | ~~↓~~ BIH-01326-04 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 05 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 06 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 01 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ 08 | ↓ | ↓ | [illegible] |



Reviewed By: SDL Initials Date: 7-8-14

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 6-23-14 | 16:14 | B14-01326-09 | B14-01326 | 1757 | [illegible] |
| ↓ | ↓ | ↓ -10 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -11 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -12 | ↓ | ↓ | [illegible] |
| 6-24-14 | 15:54 | 5NC16 | QA | QA | [illegible] |
| | | | | | |
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SDR 7-18-14



Reviewed By: SDR Date: 7-18-14
Initials

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting

# Control Charts

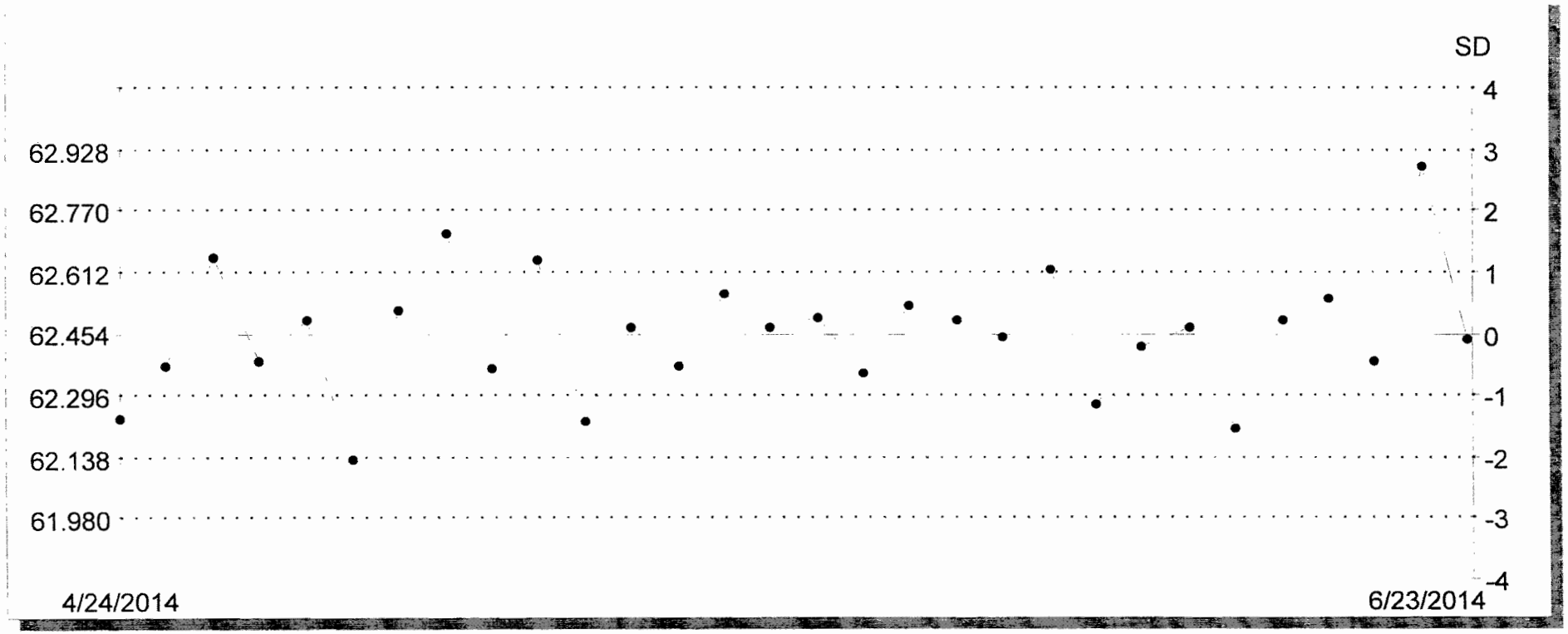
3H Efficiency

Total # pts : 5888
Valid # pts : 30
Mean : 62.45
SD : 0.16

| Date | Value | Valid Pt |
|---|---|---|
| Apr 24, 2014 | 62.24 | X |
| Apr 25, 2014 | 62.37 | X |
| Apr 28, 2014 | 62.65 | X |
| Apr 30, 2014 | 62.38 | X |
| May 02, 2014 | 62.49 | X |
| May 02, 2014 | 62.13 | X |
| May 05, 2014 | 62.51 | X |
| May 06, 2014 | 62.71 | X |
| May 07, 2014 | 62.36 | X |
| May 09, 2014 | 62.64 | X |
| May 09, 2014 | 62.23 | X |
| May 09, 2014 | 62.47 | X |
| May 10, 2014 | 62.37 | X |
| May 14, 2014 | 62.56 | X |
| May 14, 2014 | 62.47 | X |
| May 16, 2014 | 62.49 | X |
| May 20, 2014 | 62.35 | X |
| May 21, 2014 | 62.53 | X |
| May 22, 2014 | 62.49 | X |
| May 22, 2014 | 62.44 | X |
| Jun 06, 2014 | 62.62 | X |
| Jun 09, 2014 | 62.27 | X |
| Jun 10, 2014 | 62.42 | X |
| Jun 10, 2014 | 62.47 | X |
| Jun 12, 2014 | 62.21 | X |
| Jun 13, 2014 | 62.49 | X |
| Jun 16, 2014 | 62.54 | X |
| Jun 18, 2014 | 62.38 | X |
| Jun 23, 2014 | 62.88 | X |
| Jun 23, 2014 | 62.44 | X |

3H Efficiency

| | |
|---|---|
| Total # pts | : 5888 |
| Valid # pts | : 30 |
| Mean | : 62.45 |
| SD | : 0.16 |

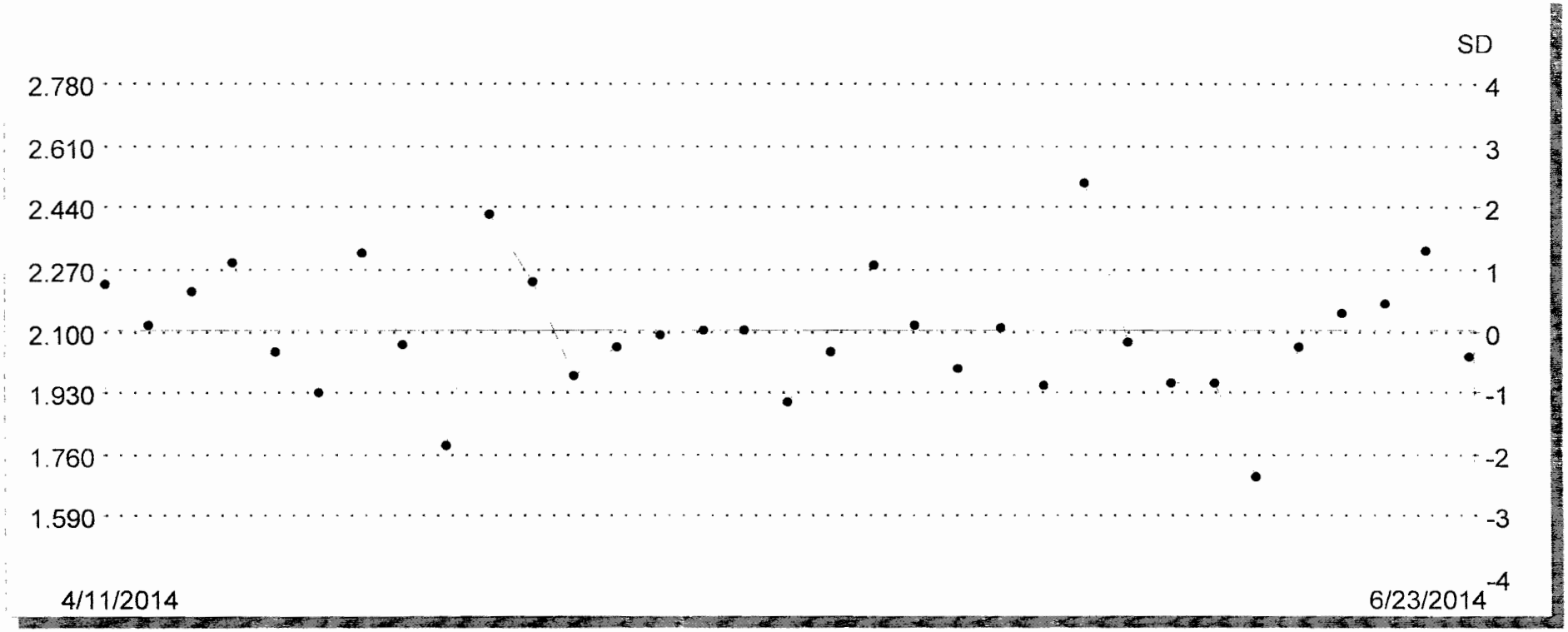


3H Background
Total # pts : 5813
Valid # pts : 33
Mean : 2.10
SD : 0.17

| Date | Value | Valid Pt |
|---|---|---|
| Apr 11, 2014 | 2.23 | X |
| Apr 12, 2014 | 2.12 | X |
| Apr 15, 2014 | 2.21 | X |
| Apr 17, 2014 | 2.29 | X |
| Apr 24, 2014 | 2.05 | X |
| Apr 25, 2014 | 1.93 | X |
| Apr 28, 2014 | 2.32 | X |
| Apr 30, 2014 | 2.07 | X |
| May 02, 2014 | 1.79 | X |
| May 02, 2014 | 2.42 | X |
| May 05, 2014 | 2.24 | X |
| May 06, 2014 | 1.98 | X |
| May 07, 2014 | 2.06 | X |
| May 09, 2014 | 2.09 | X |
| May 09, 2014 | 2.10 | X |
| May 09, 2014 | 2.10 | X |
| May 10, 2014 | 1.90 | X |
| May 14, 2014 | 2.04 | X |
| May 14, 2014 | 2.28 | X |
| May 16, 2014 | 2.12 | X |
| May 20, 2014 | 2.00 | X |
| May 21, 2014 | 2.11 | X |
| May 22, 2014 | 1.95 | X |
| Jun 06, 2014 | 2.51 | X |
| Jun 09, 2014 | 2.07 | X |
| Jun 10, 2014 | 1.96 | X |
| Jun 10, 2014 | 1.96 | X |
| Jun 12, 2014 | 1.70 | X |
| Jun 13, 2014 | 2.06 | X |
| Jun 16, 2014 | 2.15 | X |
| Jun 18, 2014 | 2.17 | X |
| Jun 23, 2014 | 2.33 | X |
| Jun 23, 2014 | 2.03 | X |

3H Background

| | |
|---|---|
| Total # pts | : 5813 |
| Valid # pts | : 33 |
| Mean | : 2.10 |
| SD | : 0.17 |



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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Liquid Scintillation Counting

# Calibration Information

ARS INTERNATIONAL

# QUALITY CONTROL PROGRAM

AMERICAN RADIATION SERVICES
RADIOACTIVE REFERENCE SOLUTIONS

## ANNUAL ACTIVITY VERIFICATION

VERIFICATION DATE: 1/7/2014 3:43 *date counted*
STANDARD REFERENCE #: S-0289

| Principal Radionuclide | | Half Life, Years | | Half Life, Days |
|---|---|---|---|---|
| H-3 | *ENTER -->* | | *OR -->* | 4.4998E+03 |
| | | 1.232E+01 | | 4.4998E+03 |

Radionuclide: H-3 — Dilution Reference Date: 1/3/2014 13:25

| | | | |
|---|---|---|---|
| Dilution Activity | 2.66 | pCi per gram ===> dpm/g | 5.91 |
| Verif. Date Decay Corrected | 2.66 | pCi per gram ===> dpm/g | 5.90 |

*Minimum of 3 Required*

| Trial ID | Sample Counts | Count Time (min) | Detector | Efficiency | Bkg. (cpm) | Net Weight | Decay Corrected Activity Result (dpm/g) | Decay Corrected Activity Result (pCi/g) |
|---|---|---|---|---|---|---|---|---|
| S-0289-V1 | 21.75 | 1 | LSC | 0.3549 | 10.54 | 5.019 | 6.29 | 2.83 |
| S-0289-V2 | 20.53 | 1 | LSC | 0.3546 | 10.54 | 4.993 | 5.64 | 2.54 |
| S-0289-V3 | 20.60 | 1 | LSC | 0.3546 | 10.54 | 4.996 | 5.68 | 2.56 |
| S-0289-V4 | 21.00 | 1 | LSC | 0.3547 | 10.54 | 5.005 | 5.89 | 2.65 |
| S-0289-V5 | 21.18 | 1 | LSC | 0.3542 | 10.54 | 4.993 | 6.02 | 2.71 |

| | | |
|---|---|---|
| Average | 5.90 | 2.66 |
| Two Sigma Uncertainty | 0.52 | 0.24 |
| Standard Deviation percent of known concentration | 4.51% | 4.51% |
| Target Activity | 5.90 | 2.66 |
| % Diff | 0.00% | 0.00% |

*10% Max* *PASS*

*5% Max* *PASS*

**Verification Expiration Date:** January 7, 2015

Prepared & Counted By _____ Date: 1/7/2014 3:43

Verified & Approved By _____ Date: 1-8-14

QC Approval _____ Date: 1-8-14

**S-0289**
**H-3**
SL
Manufactuer: NIST SRM 4927F
Sol Matrix: H2O
Ref No: NIST SRM 4927F
Tech: Unknown
Parent ID: S-0237

Verified 1/7/14
Expires **1/7/15**

ARS International
RADIOACTIVE STANDARDS – BATON ROUGE LABORATORY

Assay Definition-

Assay Description:
H3 Normal Lvl

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\20140106_1733.results
RTF File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\H3 Normal Lvl2.lsa

Count Conditions-

Nuclide: Standard H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: PE UG STD H3
Count Time (min): 120.00
Count Mode: Normal
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: n/a
Colored Samples: Off Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

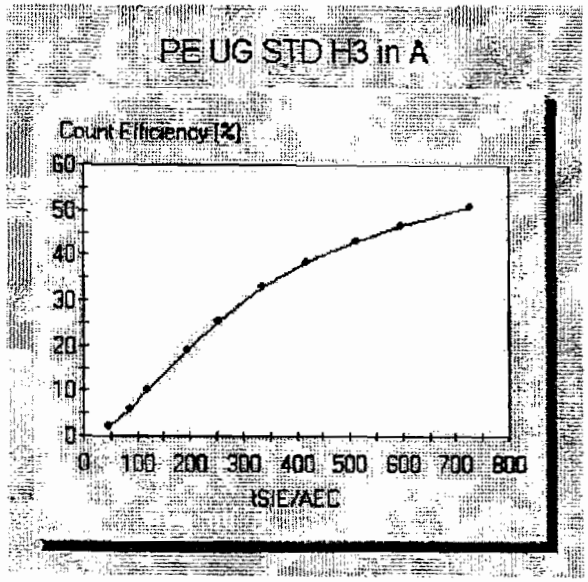
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 05/30/2013
Date Modified:
PE UG STD H3 in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 726.67 | 50.69 |
| 595.82 | 46.27 |
| 512.39 | 42.97 |
| 421.70 | 38.56 |
| 337.18 | 32.90 |
| 253.25 | 25.44 |
| 195.24 | 19.09 |
| 120.68 | 10.06 |
| 85.94 | 5.83 |
| 47.95 | 1.96 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | BACKGROUND | 10.54 | 29.70 | 375.63 | 35.48 | 120.00 | 1/6/2014 | 5:34:01 PM | |
| 20 | 2 | S-0289-V1 | 21.75 | 61.30 | 375.79 | 35.49 | 120.00 | 1/6/2014 | 7:35:52 PM | |
| 20 | 3 | S-0289-V2 | 20.53 | 57.89 | 375.34 | 35.46 | 120.00 | 1/6/2014 | 9:37:44 PM | |
| 20 | 4 | S-0289-V3 | 20.60 | 58.09 | 375.37 | 35.46 | 120.00 | 1/6/2014 | 11:39:36 PM | |
| 20 | 5 | S-0289-V4 | 21.00 | 59.21 | 375.58 | 35.47 | 120.00 | 1/7/2014 | 1:41:31 AM | |
| 20 | 6 | S-0289-V5 | 21.18 | 59.80 | 374.77 | 35.42 | 120.00 | 1/7/2014 | 3:43:23 AM | |

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

| Planning | |
|---|---|
| Planning Comments | Create an H-3 LCS standard |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.67265112 |
| Appx vol ml of Parent Sol'n | 3.629273813 |
| Expected Addition for Analysis g | 5 |

| Standards Preparation / Dilution | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 01/03/2013 13:25 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | 3.9375 |
| DPM Xferred on 01/03/2013 13:25 | 11793.25195 |
| Diluent/matrix | DI H2O |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.9 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | 2000 |
| Final Dilution Density (g/mL) | 0.99607 |
| Final Dilution Measured Mass g | 1996.14 |
| Comments | H3 LCS standard. Dilution performed as stated above by BSteffens on 1/3/13. BJS 1/3/13 |
| Final Dilution dpm/g | 5.908028472 |
| Final Dil New Ref Date/Time | 01/03/2013 13:25 |

## Parent Standard Data

| | | | | |
|---|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | | |
| Parent Solution # | S-0237 | | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.9000000 | |
| Parent Reference Date | 03/22/2010 10:10 | | | |
| Parent Certified Act | 3503.682716 | Certi Act/Vol Units | dpm | g |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | | |
| Parent Supplier | NIST SRM 4927F | | | |
| Parent Date Recvd | 01/02/00 | | | |
| Parent Received By | Unknown | | | |
| Parent Cert Exp Date | | | | |
| Parent Matrix | H2O | | | |
| Certified dpm/g At Ref Date | 3503.682716 | | | |
| Certified dpm/g on 01/03/2013 13:25 | 2995.111607 | | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens -BJS 3/22/10 | | | |
| Parent Tech | Unknown | | | |
| Is_Primary | FALSE | | | |
| Is_LCS | TRUE | | | |
| Is_Tracer | FALSE | | | |
| Is_Calib | FALSE | | | |

**H-3 Standard Verification**

**Verifier's Name:** Brian Steffens **Date:** 1/6/2014

**Pipettor ID:** FJ40469

**Pipettor ID:** Auto-pipettor

**Pipettor ID:** na

**Standard ID:** S-0289

**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard |
|---|---|
| **S-0289-V1** | 5.019 g |
| **S-0289-V2** | 4.993 g |
| **S-0289-V3** | 4.996 g |
| **S-0289-V4** | 5.005 g |
| **S-0289-V5** | 4.993 g |
| | |
| | |
| | |
| | |
| | |

**Balance ID:** H1331122173560P

## H-3 Standard Verification

**Verifier's Name:** Brian Steffens **Date:** 1-6-14

**Pipettor ID:** FJ40469
**Pipettor ID:** Auto-pipettor
**Pipettor ID:** na
**Standard ID:** S-0289
**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard | |
|---|---|---|
| S-0289-V1 | 5.019 | g |
| S-0289-V2 | 4.993 | g |
| S-0289-V3 | 4.996 | g |
| S-0289-V4 | 5.005 | g |
| S-0289-V5 | 4.993 | g |
| | | |
| | | |
| | | |
| | | |
| | | |

**Balance ID:** H1331122173560P

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

### Planning

| | |
|---|---|
| Planning Comments | |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.884999595 |
| Appx vol ml of Parent Sol'n | 3.892005204 |
| Expected Addition for Analysis g | |

### Standards Preparation / Dilution

| | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 1-3-13 1325 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | |
| DPM Xferred on 01/03/2014 11:01 | |
| Diluent/matrix | |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.90 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | |
| Final Dilution Density (g/mL) | |
| Final Dilution Measured Mass g | |
| Comments | |
| Final Dilution dpm/g | |
| Final Dil New Ref Date/Time | 01/03/2014 11:01 |

## Parent Standard Data

| | | | | |
|---|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | | |
| Parent Solution # | S-0237 | | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.6000000 | |
| Parent Reference Date | 03/22/2010 10:10 | | | |
| Parent Certified Act | 3503.682716 | Certl Act/Vol Units | dpm | g |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | | |
| Parent Supplier | NIST SRM 4927F | | | |
| Parent Date Recvd | 01/02/00 | | | |
| Parent Received By | Unknown | | | |
| Parent Cert Exp Date | | | | |
| Parent Matrix | H2O | | | |
| Certified dpm/g At Ref Date | 3503.682716 | | | |
| Certified dpm/g on 01/03/2014 11:01 | 2831.403127 | | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. BJS 3/22/10 | | | |
| Parent Tech | Unknown | | | |
| Is_Primary | FALSE | | | |
| Is_LCS | TRUE | | | |
| Is_Tracer | FALSE | | | |
| Is_Calib | FALSE | | | |

2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Folder Duplicate

# Report Compilation Checklist

**ARS SDG:** 14-01566 **Client Name:** LANL **Sample Matrix:** AQ

| LEVEL 1 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 1) Cover Page Complete and Accurate (see ARS-059)? | ~~Yes~~ No N/A | |
| 2) Technical Review Checklist(s) Complete and Accurate? | ~~Yes~~ No N/A | |
| 3) Case Narrative Complete and Accurate (see ARS-059)? | ~~Yes~~ No N/A | |
| 4) Form 1s Present for all Samples and Tests? | ~~Yes~~ No N/A | |
| 5) Client Specific Components are Present and Complete? | Yes No ~~N/A~~ | |

| LEVEL 2 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 6) Batch Quality Control Report is Present and Accurate? | ~~Yes~~ No N/A | |
| 7) DQO Report is Present and Accurate? | ~~Yes~~ No N/A | |
| 8) Client Specific Batch QC Components are Present and Complete? | ~~Yes~~ No N/A | |

| LEVEL 3 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 9) Efficiencies are Present? | ~~Yes~~ No N/A | |
| 10) Calibrations are Present? | ~~Yes~~ No N/A | |
| 11) Backgrounds are Present? | ~~Yes~~ No N/A | |
| 12) Spectrum Analysis is Present? | ~~Yes~~ No N/A | |
| 13) Spectral Plots are Present? | ~~Yes~~ No N/A | |
| 14) Plateaus are Present? | ~~Yes~~ No N/A | |
| 15) Control Charts are Present? | ~~Yes~~ No N/A | |
| 16) Other: | Yes No ~~N/A~~ | |

| LEVEL 4 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 17) Preparation Raw Data Present, Signed and Complete? | ~~Yes~~ No N/A | |
| 18) Instrument Raw Data Present and Complete? | ~~Yes~~ No N/A | |
| 19) Calibration Certificates Present? | ~~Yes~~ No N/A | |
| 20) Copies of Log Book Pages Present? | ~~Yes~~ No N/A | |
| 21) Sample Receiving Documentation Present? | ~~Yes~~ No N/A | |
| 22) LIMS Reports Present? | ~~Yes~~ No N/A | |
| 23) Applicable Correspondence Present? | ~~Yes~~ No N/A | |
| 24) Other: | Yes No ~~N/A~~ | |

SOL 7-18-14
**Report Generator Signature** **Date**

James D. [illegible] 7-18-14
**Management Review Signature** **Date**

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-01566

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

| **ARS A. Batch ID(s):** | **Batch A:** B14-01326 | **Batch B:** N/A | **Batch C:** N/A |
|---|---|---|---|
| **Test Method(s):** | LSC-A-021 | N/A | N/A |

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| **1) 100% of Manual Transcriptions Verified?** | Yes No N/A | Yes No N/A |
| **2) 100% of Manual Calculations Verified?** | Yes No N/A | Yes No N/A |
| **3) Blank Composition/Configuration Matches Calibration?** | Yes No N/A | Yes No N/A |
| **4) Deviations from procedure are documented and verified?** | Yes No N/A | Yes No N/A |
| **5) Appropriate Cocktail Selected?** | Yes No N/A | Yes No N/A |

**6) Sample Prep Anomaly?** ☑ **No** ☐ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

| Chemist Signature | Date | Verifier Review Signature | Date |
|---|---|---|---|
| [signature] | 6-24-14 | Heather Harrington | 6-24-14 |

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| **1) Calibrations Valid and Current?** | Yes No N/A | Yes No N/A |
| **2) Backgrounds Valid and Current?** | Yes No N/A | Yes No N/A |
| **3) Source Checks Completed and Acceptable?** | Yes No N/A | Yes No N/A |

| QA Officer Signature | Date |
|---|---|
| James D. [signature] | 7-18-14 |

| | Analyst Review | Technicial Review |
|---|---|---|
| **4) Background Checks Complete and Acceptable?** | Yes No N/A | Yes No N/A |
| **5) 100% of Manually Entered Parameters Verified Accurate?** | Yes No N/A | Yes No N/A |
| **6) Appropriate QC samples initiated at required frequency?** | Yes No N/A | Yes No N/A |
| **6) Test/Sample Specific Parameters** (See ARS-059 for details) | | NA |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

**7) Analysis Anomaly?** ☑ **No** ☐ **Yes** (See Comments) **NCR #** (If initiated): _____

| Analyst Signature | Date | Technicial Reviewer Signature | Date |
|---|---|---|---|
| [signature] | 7-18-14 | NA | |

Batch A: B14-01326

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes No ~~N/A~~ | Yes No N/A |
| 2) RDL Criteria are Met? | Yes No ~~N/A~~ | Yes No N/A |
| 3) Method Blank Criterion Met? | Yes No ~~N/A~~ | Yes No N/A |
| 4) LCS/LCD Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |
| 6) MS/MSD Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

| Project Manager Signature | Date | QA Officer Signature | Date |
|---|---|---|---|
| SDL | 7-18-14 | James D. Rue | 7-18-14 |

## GENERAL COMMENTS

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-01566

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

**ARS A. Batch ID(s):** **Batch A:** B14-01354 **Batch B:** N/A **Batch C:** N/A

**Test Method(s):** LSC-A-022 N/A N/A

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | | | Verifier Review | | |
|---|---|---|---|---|---|---|
| **1) 100% of Manual Transcriptions Verified?** | Yes | No | N/A | Yes | No | N/A |
| **2) 100% of Manual Calculations Verified?** | Yes | No | N/A | Yes | No | N/A |
| **3) Blank Composition/Configuration Matches Calibration?** | Yes | No | N/A | Yes | No | N/A |
| **4) Deviations from procedure are documented and verified?** | Yes | No | N/A | Yes | No | N/A |
| **5) Appropriate Cocktail Selected?** | Yes | No | N/A | Yes | No | N/A |

**6) Sample Prep Anomaly?** ☑ **No** ☐ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

Chemist Signature: [signature] Date: 7-14-14

Verifier Review Signature: Christie Bailey Date: 7-14-14

## B. ANALYSIS REVIEW

| | Analyst Review | | | QA Officer Review | | |
|---|---|---|---|---|---|---|
| **1) Calibrations Valid and Current?** | Yes | No | N/A | Yes | No | N/A |
| **2) Backgrounds Valid and Current?** | Yes | No | N/A | Yes | No | N/A |
| **3) Source Checks Completed and Acceptable?** | Yes | No | N/A | Yes | No | N/A |

QA Officer Signature: James D. [signature] Date: 7-18-14

| | Analyst Review | | | Technicial Review | | |
|---|---|---|---|---|---|---|
| **4) Background Checks Complete and Acceptable?** | Yes | No | N/A | Yes | No | N/A |
| **5) 100% of Manually Entered Parameters Verified Accurate?** | Yes | No | N/A | Yes | No | N/A |
| **6) Appropriate QC samples initiated at required frequency?** | Yes | No | N/A | Yes | No | N/A |
| **6) Test/Sample Specific Parameters** (See ARS-059 for details) | | | | | | |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes | No | N/A | Yes | No | N/A |
| b) Spectra show no Evidence of Interferences? | Yes | No | N/A | Yes | No | N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes | No | N/A | Yes | No | N/A |

**7) Analysis Anomaly?** ☑ **No** ☐ **Yes** (See Comments) **NCR #** (If initiated): _____

Analyst Signature: [signature] Date: 7-18-14

Technicial Reviewer Signature: [signature] Date: 7-18-14

Batch A: B14-01354

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes ~~No~~ N/A | Yes (No) N/A |
| 2) RDL Criteria are Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 3) Method Blank Criterion Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 4) LCS/LCD Criteria Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 6) MS/MSD Criteria Met? | Yes No ~~N/A~~ | Yes No (N/A) |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

| Project Manager Signature | Date | QA Officer Signature | Date |
|---|---|---|---|
| SDL | 7-18-14 | James D. Lu | 7-18-14 |

## GENERAL COMMENTS

# DQO Report for SDG
ARS1-14-01566



| Analysis Code | Group | Isotope | Activity Units | Aliquot Units | ProcedureNo | RDL | LCS_LL | LCS_UL | MS_LL | MS_UL | RadY_LL | RadY_UL | GravY_LL | GravY_LL | RER | RPD | DiltionReq | RoughPrepReq | BlankCorrectionMDA | BlankCorrectionAll | CountTimeReq | AliquotRequired |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-021 | STD | H-3 | pCi | L | ARS-054 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | | |
| LSC-A-022 | STD | Enriched H-3 | pCi | L | ARS-040 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | | |

# SDG Report - Samples and Containers

**SDG Specific Data**

| | | | | | |
|---|---|---|---|---|---|
| SDG | ARS1-14-01566 | TAT Days | 28 | Project Type | Environmental |
| Sample Count | 1 Rpt Level 2 | Date Received | 6/20/2014 | COC Number | 2014-3585 |
| Client | Los Alamos National Laboratory | Client Deadline | 7/30/2014 | PO Number | |
| Client Code | 114 | Internal Deadline | 7/29/2014 | Job Number | |
| Profile Number | PN-00444 | Lab Deadline | 7/25/2014 | Job Location | |
| Comments | | | | | |

**Samples and Containers (➔) Checked In Thus Far**

| FR | ClientID | Matrix | SampleStartDate | SampleEndDate | Disp | Hold | Arch | Storage | X | Units | Y | Units | Z | Units | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | CALA-14-79460 | AQ | 06/18/14 09:53 AM | 06/18/14 09:53 AM | H | 190 | 5 | O4 | | | | | | | |
| ➔ | IC_ID | Cnt | Volume_mL | Wt_g | pH_Orig | pH_Final | CPM | uR_Hr | Storage | VOA | Head Sp | AF Units | AF Rate | AF Mins | AF Total Vol |
| | 164828 | 1 | 1000.00 | | | | 80 | 24 | | N | N/A | | | | |

# SDG Report - Analysis Assignments

| | | | |
|---|---|---|---|
| Temp SDG | ARS1-14-01566 | Sample Count | 1 |
| Client | Los Alamos National Laboratory | Analysis Count | 2-2 |

**Samples Count Totals per Analysis**

| Analysis Code | Analysis Description | Samples Count |
|---|---|---|
| LSC-A-021 | Low Level Tritium Screen in (Aqueous) | 1 |
| LSC-A-022 | Low Level Tritium by Enrichment Process in (Aqueous [AQ]) | 1 |

**Analyses Assigned Per Fraction**

| Fraction | Analysis Code | X = Assigned |
|---|---|---|
| 001 | LSC-A-021 | X |
| 001 | LSC-A-022 | X |

# ARS FILE TRACKING SHEET

**SDG:** ARS1-14-01566

| Task | Date / Time | Initials |
|---|---|---|
| Date & Time Samples Received | 06-20-14 11:06 | JH |
| ICOC Initiated/Storage Location: O4 | 06-20-14 12:21 | JH |
| Technical Checks Performed | See Batch | |
| Report Written / EDD Generated 7-18-14 \| 1121 \| SDL | 7-18-14 \| 1309 | SDL |
| Quality Assurance Checks Performed on Report | 7-18-14 1325 | JT |
| Management Checks Performed on Report | | |
| *Preliminary Report Scan* | | |
| Report E-mailed/Faxed | | |
| Invoice Completed Invoice #:_____ | | |
| Requires Report Mailed Yes / ~~No~~ | | |
| Requires Original COC mailed Yes / ~~No~~ | | |
| Report Reviewed and Imaged | | |

**SPECIAL REQUIREMENTS**

| Requirement | Yes | No |
|---|---|---|
| 3 Hour Rush | ☐ | ☑ |
| 24 Hour Rush | ☐ | ☑ |
| 48 Hour Rush | ☐ | ☑ |
| 3 Day Rush | ☐ | ☑ |
| 5 Day Rush | ☐ | ☑ |
| 10 Day Rush | ☐ | ☑ |
| Standard Oil/Gas Client (5 Day) | ☐ | ☑ |
| Standard Turnaround | ☑ | ☐ |

**NOTES**

Federal

ARS-062-005 r6

**COMPANY NAME:** Los Alamos National Laboratory **SDG:** ARS1-14-01566

**SHIPPING CONTAINER**

| | | |
|---|---|---|
| Good Condition | ☑ Yes | ☐ No |
| Radioactive | ☐ Yes | ☑ No |
| UN2910 | ☐ Yes | ☐ No |
| Sec. Seals | ☑ Yes | ☐ No |
| Seals Intact | ☑ Yes ☐ No ☐ N/A | |
| Air Bill | ☐ Yes | ☑ No |

**COC PRESENT WITH SAMPLES**

| | | |
|---|---|---|
| COC | ☑ Yes | ☐ No |

**SAMPLE CONTAINER(S)**

| | | |
|---|---|---|
| Good Condition | ☑ Yes | ☐ No |
| Sec. Seals | ☑ Yes | ☐ No |
| Seal Intact | ☑ Yes ☐ No ☐ N/A | |
| Marked Radioactive | ☐ Yes | ☑ No |

# Samples Rcv 1

Matrix [ AF , AQ , BI , FE , LT , SI , SO , UR , VG ]

**External and Internal Surveys**

| | | | | | |
|---|---|---|---|---|---|
| Exposure Rate Meter: | M3 242861 | Serial No.: | PR 264266 | Calibration Due Date: | 4/16/15 |
| Count Rate Meter: | M2 154859 | Serial No.: | PR 184559 | Calibration Due Date: | 4/16/15 |

| | | | | |
|---|---|---|---|---|
| Background Exposure Rate (µR/hr) | 24 | Max Exposure Rate on Shipping Containers Externals (Plus Bkgd) | 24 | µR/hr |
| Background Count Rate (cpm) | 80 | Max. Removable Count Rate on Shipping Containers Externals (Plus Bkgd) | 80 | cpm |
| | | Max. Removable Count Rate on Shipping Containers Internals (Plus Bkgd) | 80 | cpm |

Acceptance Limits: <500 µR/hr, <100 cpm/cm²

| Sample Label/Comments/Notes | pH Orig | pH Final | Mark if Preserve | Acid Lot # | Weight(g) / Volume(mL) | µR/hr | cpm |
|---|---|---|---|---|---|---|---|
| CALA-14-PA60 | | | ☐ | GCH 6-20-14 | 1000 | 24 | 80 |
| | | | ☐ | | | | |
| | | | ☐ | | | | |
| | | | ☐ | | | | |
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| | | | ☐ | | | | |
| | | | ☐ | | | | |
| | | | ☐ | | | | |

pH < 2 is Acceptable

Surveyors' Name: [signature] Date/Time Surveyed: 6-20-14 @ 11:00

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEQ

COC/Lab Request #: 2014-3585

Page 1 of 1

**Client Contact:**

**Lab Agreement # :** 63641-001-10
**Project Number :**
**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CALA-14-79460 | Jun 18 2014 | 09:53 | W | 1 |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Michael Martinez | 6/19/14 3:00 | | Jessica Hilliday | 6-20-14 11:00 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

COC/Lab Request #: 2014-2723



**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:**

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|
| CAMO-14-45690 | Dec 19 2013 | 11:21 | W | | 1 | | | 1 |
| CAMO-14-45694 | Dec 19 2013 | 11:21 | W | 1 | | 1 | 1 | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martinez | 12/22/13 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4459 **EVENT NAME:** Mortandad/Sandia (MDA C and GS Monitoring) MY2014 Q1 Watershed Sampling_MORTANDAD

**SAMPLE ID:** CAMO-14-45690 **WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 12/19/~~25~~ 2013 DJF 12/19/13 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1121 | MEDIA: | UA | ↓ |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | GSP |
| LOCATION ID: | R-34 | ↓ | FIELD PREP: | UF | OK |
| LOCATION TYPE: | MON | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | SINGLE COMPLETION | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-CN(T) | 250 ML POLY | 1 | NAOH | Y | NA |
| ↓ | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:** NA

**LOCATION COMMENTS:** Sampled within 50' of running diesel generator Q = 2-97 gpm

**FIELD PARAMETERS:**

Dissolved Oxygen 6.82 mg/L Oxidation-Reduction Potential -8.3 mV pH 8.27 SU

Specific Conductance 152 uS/cm Temperature 17.77 deg C Turbidity 1.7 NTU

**COLLECTED BY (PRINT)** J. Maze

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) David Fellenz (Signature) [signature] | 12/19/13 1205 | (Printed Name) K. Greene (Signature) [signature] | 12/19/13 12:05 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date 11/04/2013

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4459

**EVENT NAME:** Mortandad/Sandia (MDA C and GS Monitoring) MY2014 Q1 Watershed Sampling_MORTANDAD

**SAMPLE ID:** CAMO-14-45694

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 12/19/2013 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1121 | MEDIA: | UA | ↓ |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | NA |
| LOCATION ID: | R-34 | ↓ | FIELD PREP: | F | OK |
| LOCATION TYPE: | MON | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | SINGLE COMPLETION | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | NA |
| ↓ | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:** NA

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen NA mg/L  Oxidation-Reduction Potential NA mV  pH NA SU

Specific Conductance NA uS/cm  Temperature NA deg C  Turbidity NA NTU

**COLLECTED BY (PRINT)** M. Shendo

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) David Fellenz<br>(Signature) | 12/19/13 1205 | (Printed Name) K. Green<br>(Signature) | 12/19/13 1205 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 11/04/2013

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-2723

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 339881 | EPA:120.1 | 1 | | | | |
| 339881 | EPA:150.1 | 1 | | | | |
| 339881 | EPA:160.1 | 1 | | | | |
| 339881 | EPA:245.2 | 1 | | | | |
| 339881 | EPA:300.0 | 1 | | | | |
| 339881 | EPA:310.1 | 1 | | | | |
| 339881 | EPA:335.4 | 1 | | | | |
| 339881 | EPA:350.1 | 1 | | | | |
| 339881 | EPA:351.2 | 1 | | | | |
| 339881 | EPA:353.2 | 1 | | | | |
| 339881 | EPA:365.4 | 1 | | | | |
| 339881 | SM:A2340B | 1 | | | | |
| 339881 | SW-846:6010B | 1 | | | | |
| 339881 | SW-846:6020 | 1 | | | | |
| 339881 | SW-846:6850 | 1 | | | | |
| 339881 | SW-846:9060 | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 339881 | EPA:120.1 | 1357945 | 1357945 | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 339881 | EPA:150.1 | 1357003 | 1357003 | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 339881 | EPA:160.1 | 1356318 | 1356318 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 339881 | EPA:245.2 | 1357935 | 1357934 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 339881 | EPA:300.0 | 1356558 | 1356558 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 339881 | EPA:310.1 | 1357057 | 1357057 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 339881 | EPA:335.4 | 1357049 | 1357048 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 339881 | EPA:350.1 | 1356392 | 1356391 | 1 | | | | | 1 | 1 | | | | 1 | 1 | | | 1 | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 339881 | EPA:351.2 | 1357047 | 1357046 | 1 | | | | | 1 | 1 | | | | 1 | 1 | | | 1 | | | |
| 339881 | EPA:353.2 | 1356403 | 1356403 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 339881 | EPA:365.4 | 1357042 | 1357041 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 339881 | SM:A2340B | 1360597 | 1360597 | 1 | | | | | | | | | | | | | | | | | |
| 339881 | SW-846:6010B | 1356425 | 1356424 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 339881 | SW-846:6020 | 1356446 | 1356445 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 339881 | SW-846:6020 | 1360531 | 1360530 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 339881 | SW-846:6850 | 1356870 | 1356869 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 339881 | SW-846:9060 | 1357248 | 1357248 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAPA-14-49425 | 1203014507 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203014506 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWA-14-46042 | 1203012399 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203012402 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-14-45694 | 1203010648 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203010649 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203010647 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203014468 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203014467 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | WST59-14-49655 | 1203014469 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | WST59-14-49655 | 1203014470 | MS | 0 | 0 | 1 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-45694 | 1203011178 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-45694 | 339881002 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203011180 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203011177 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-14-45694 | 339881002 | REG | 2 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203012529 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203012528 | MB | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | WST59-14-49656 | 1203012532 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | WST59-14-49656 | 1203012533 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-14-45690 | 1203012510 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-14-45690 | 1203012513 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-14-45690 | 339881001 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203012517 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203012509 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-14-45694 | 1203010817 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-14-45694 | 1203010819 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203010821 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCSD | 1203010822 | LCSD | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203010816 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-45690 | 1203012499 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-45690 | 1203012500 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-45690 | 339881001 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203012501 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCSD | 1203012502 | LCSD | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203012498 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-14-45694 | 1203010840 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203010845 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203010836 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203012491 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203012490 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | WST59-14-49656 | 1203012492 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | WST59-14-49656 | 1203012493 | MS | 0 | 0 | 1 | 0 |
| SM:A2340B | INORGANIC | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CAMO-14-45694 | 339881002 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | LCS | 1203010880 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC | MB | 1203010879 | MB | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | WST59-14-49655 | 1203010881 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | WST59-14-49655 | 1203010882 | MS | 0 | 0 | 17 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-45694 | 339881002 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203010904 | LCS | 0 | 0 | 10 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203020214 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203010903 | MB | 10 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:6020 | INORGANIC | MB | 1203020213 | MB | 1 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | WST59-14-49655 | 1203010905 | DUP | 10 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | WST59-14-49655 | 1203010906 | MS | 0 | 0 | 10 | 0 |
| SW-846:6020 | INORGANIC | WST59-14-49655 | 1203020215 | DUP | 1 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | WST59-14-49655 | 1203020216 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-45694 | 1203012013 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-45694 | 1203012014 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-45694 | 339881002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203012012 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203012011 | MB | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-14-45690 | 339881001 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWA-14-46038 | 1203013033 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203013037 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203013032 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203010816 | METHOD BLANK | EPA:350.1 | W | Ammonia as Nitrogen | 0.0225 | J | mg/L | 0.050 |
| MB | 1203010903 | METHOD BLANK | SW-846:6020 | W | Arsenic | 2.29 | J | ug/L | 5.00 |
| MB | 1203010903 | METHOD BLANK | SW-846:6020 | W | Molybdenum | .221 | J | ug/L | 0.500 |

# DATA VALIDATION REPORT

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-45694 | 1203010816 | METHOD BLANK | EPA:350.1 | Ammonia as Nitrogen | 0.0225 | mg/L | 0.0423 | J | 0.050 | Y | 5 | | Y |
| CAMO-14-45694 | 1203010903 | METHOD BLANK | SW-846:6020 | Arsenic | 2.29 | ug/L | 2.13 | J | 5.00 | Y | 5 | | Y |
| CAMO-14-45694 | 1203010903 | METHOD BLANK | SW-846:6020 | Molybdenum | .221 | ug/L | 1.01 | | 0.500 | Y | 5 | | Y |

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-45690 | 1203012513 | | EPA:335.4 | Cyanide (Total) | 1357048 | 01-02-2014 | W | 63.9 | | 110 | 90 | 10 | | |
| CAMO-14-45690 | 1203012513 | | EPA:335.4 | Cyanide (Total) | 1357048 | 01-02-2014 | W | 63.9 | | 110 | 90 | 10 | | |
| CAMO-14-45694 | 1203010819 | | EPA:350.1 | Ammonia as Nitrogen | 1356391 | 12-27-2013 | W | 77.5 | | 110 | 90 | 10 | | |
| CAMO-14-45694 | 1203010819 | | EPA:350.1 | Ammonia as Nitrogen | 1356391 | 12-27-2013 | W | 77.5 | | 110 | 90 | 10 | | |
| WST59-14-49656 | 1203012493 | | EPA:365.4 | Total Phosphate as Phosphorus | 1357041 | 01-03-2014 | W | -700 | | 134 | 64 | 10 | | |
| WST59-14-49655 | 1203010882 | | SW-846:6010B | Boron | 1356424 | 01-07-2014 | W | 20.4 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010882 | | SW-846:6010B | Cobalt | 1356424 | 01-03-2014 | W | 70.2 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010882 | | SW-846:6010B | Copper | 1356424 | 01-03-2014 | W | 34.9 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010882 | | SW-846:6010B | Iron | 1356424 | 01-03-2014 | W | 304 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010882 | | SW-846:6010B | Potassium | 1356424 | 01-07-2014 | W | 1280 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010882 | | SW-846:6010B | Silicon Dioxide | 1356424 | 01-07-2014 | W | -58.7 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010882 | | SW-846:6010B | Sodium | 1356424 | 01-06-2014 | W | 34.0 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010906 | | SW-846:6020 | Cadmium | 1356445 | 01-14-2014 | W | 66.8 | | 125 | 75 | 10 | | |

# DATA VALIDATION REPORT

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WST59-14-49655 | 1203010906 | | SW-846:6020 | Molybdenum | 1356445 | 01-14-2014 | W | 68.7 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010906 | | SW-846:6020 | Nickel | 1356445 | 01-14-2014 | W | 71.4 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203010906 | | SW-846:6020 | Silver | 1356445 | 01-14-2014 | W | 37.4 | | 125 | 75 | 10 | | |
| WST59-14-49655 | 1203020216 | | SW-846:6020 | Thallium | 1360530 | 01-20-2014 | W | 39.1 | | 125 | 75 | 10 | | |
| CAMO-14-45694 | 1203012013 | 1203012014 | SW-846:6850 | Perchlorate | 1356869 | 01-07-2014 | W | 97 | 94 | 125 | 75 | 10 | 1 | 0 |

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203010821 | 1203010822 | EPA:350.1 | Ammonia as Nitrogen | 1356391 | 12-27-2013 | W | 104 | 105 | 110 | 90 | | 10 | .957 | 0 |
| 1203012501 | 1203012502 | EPA:351.2 | Total Kjeldahl Nitrogen | 1357046 | 01-03-2014 | W | 100 | 99.4 | 110 | 90 | | 10 | .602 | 0 |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

| Field Sample ID | Lab Sample ID | LD Lab Sample ID | Analytical Method | Parameter Name | Sample Matrix | Lab Result | LD Lab Result | Lab Units | Detect Flag | LD Detect Flag | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-45694 | 339881002 | 1203011178 | EPA:300.0 | Chloride | W | 2.45 | 2.44 | mg/L | Y | Y | .434 | 0 |
| CAMO-14-45694 | 339881002 | 1203011178 | EPA:300.0 | Fluoride | W | 0.305 | 0.305 | mg/L | Y | Y | .0983 | 0 |
| CAMO-14-45694 | 339881002 | 1203011178 | EPA:300.0 | Sulfate | W | 2.40 | 2.78 | mg/L | Y | Y | 14.8 | 0 |
| CAMO-14-45694 | 339881002 | 1203010840 | EPA:353.2 | Nitrate-Nitrite as | W | 0.938 | 0.942 | mg/L | Y | Y | .426 | 0 |

# DATA VALIDATION REPORT

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-34 | 2014-2723 | CAMO-14-45690 | REG | INIT | GENERAL CHEMISTRY | EPA:335.4 | Cyanide (Total) | | J- | I6a | Y | 16.8 | ug/L | 0.0168 | mg/L | | | W | 12/19/2013 | | 1357049 | VAL | Y |
| R-34 | 2014-2723 | CAMO-14-45694 | REG | INIT | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | J | U | I4 | N | 0.0423 | mg/L | 0.0423 | mg/L | | | W | 12/19/2013 | | 1356392 | VAL | Y |
| R-34 | 2014-2723 | CAMO-14-45694 | REG | INIT | INORGANIC | SW-846:6020 | Arsenic | J | U | I4 | N | 2.13 | ug/L | 2.13 | ug/L | | | W | 12/19/2013 | | 1356446 | VAL | Y |
| R-34 | 2014-2723 | CAMO-14-45694 | REG | INIT | INORGANIC | SW-846:6020 | Molybdenum | | U | I4 | N | 1.01 | ug/L | 1.01 | ug/L | | | W | 12/19/2013 | | 1356446 | VAL | Y |

| Reason Code | Description |
|---|---|
| I4 | the sample result is =<5x the concentration of related analyte in the method blank. |
| I6a | The associated matrix spike recovery was below the lower acceptance limit (LAL) but >10%. Follow the external laboratory limits located within the associated data package. |
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAMO-14-45690 | R-34 | REG | EPA:335.4 | 0 | 1 |
| CAMO-14-45690 | R-34 | REG | EPA:351.2 | 0 | 1 |
| CAMO-14-45690 | R-34 | REG | SW-846:9060 | 0 | 1 |
| CAMO-14-45694 | R-34 | REG | EPA:120.1 | 0 | 1 |
| CAMO-14-45694 | R-34 | REG | EPA:150.1 | 0 | 1 |
| CAMO-14-45694 | R-34 | REG | EPA:160.1 | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAMO-14-45694 | R-34 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-45694 | R-34 | REG | EPA:300.0 | 0 | 4 |
| CAMO-14-45694 | R-34 | REG | EPA:310.1 | 0 | 2 |
| CAMO-14-45694 | R-34 | REG | EPA:350.1 | 0 | 1 |
| CAMO-14-45694 | R-34 | REG | EPA:353.2 | 0 | 1 |
| CAMO-14-45694 | R-34 | REG | EPA:365.4 | 0 | 1 |
| CAMO-14-45694 | R-34 | REG | SM:A2340B | 0 | 1 |
| CAMO-14-45694 | R-34 | REG | SW-846:6010B | 0 | 17 |
| CAMO-14-45694 | R-34 | REG | SW-846:6020 | 0 | 11 |
| CAMO-14-45694 | R-34 | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

January 20, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Water Samples
Work Order: 339881
SDG: 2014-2723

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on December 24, 2013, and analyzed for General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2014-2723
Enclosures

**ARS International (63641-10)**
**LANL-WQH Water Samples**
**Work Order #: 339881**
**SDG: 2014-2723**

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# Case Narrative

**Case Narrative for**
**ARS International (63641-10)**
**LANL-WQH Water Samples**
**Workorder #: 339881**
**SDG # : 2014-2723**

**January 20, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on December 24, 2013 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 339881001 | CAMO-14-45690 |
| 339881002 | CAMO-14-45694 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry, Metals and Perchlorates by LCMSMS.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 20 January 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−13−8 |
| Utah NELAP | SC000122013−11 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

339881

COC/Lab Request #: 2014-2723

Page 1 of 1

**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Site Name:** Los Alamos National Laboratory

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:**

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|
| CAMO-14-45690 | Dec 19 2013 | 11:21 | W | | 1 | | | 1 |
| CAMO-14-45694 | Dec 19 2013 | 11:21 | W | 1 | | 1 | 1 | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | Melissa Marks | 12/23/13 3:00 | P. Dent | Patricia Dent | 12.24.13 1045 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| **Client:** LANL | **SDG/AR/COC/Work Order:** 2014-2723 |
| **Received By:** P. Quent | **Date Received:** 12-24-13 |

| **Suspected Hazard Information** | **Yes** | **No** | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | X | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0CPM |
| Classified Radioactive II or III by RSO? | | X | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | X | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | X | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | X | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | X | |

| | **Sample Receipt Criteria** | **Yes** | **NA** | **No** | **Comments/Qualifiers (Required for Non-Conforming Items)** |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | X | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) 4C *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | X | | | Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966 |
| 3 | Chain of custody documents included with shipment? | X | | | |
| 4 | Sample containers intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | X | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | X | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | X | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | X | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | X | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | X | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | X | | | Sample ID's affected: |
| 12 | Are sample containers identifiable as GEL provided? | | | X | Clients |
| 13 | COC form is properly signed in relinquished/received sections? | X | | | |
| 14 | Carrier and tracking number. | X | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other<br>5908 1776 5988<br>5908 1776 5999<br>5908 1776 6002<br>4C |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HH Date 122413 Page 1 of 1

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 23DEC13
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWL0

4

518C4/9995/6F03

FedEx Express

J131113052301 26

TRK# 0201 5908 1776 5988

TUE - 24 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 08/10

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 23DEC13
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: XPAW001127F0

4

518C4/9995/6F03

FedEx Express

J131113052301 26

1 of 2

TRK# 0201 5908 1776 5999
## MASTER ##

TUE - 24 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 08/10

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 23DEC13
ACTWGT: 42.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: XPAW001127F0

4

518C4/99D5/6F03

FedEx Express

J131113052301 26

2 of 2

MPS# 0263 5908 1776 6002

Mstr# 5908 1776 5999

0201

TUE - 24 DEC 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RITZ 08/10

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International (ARSL)**
**SDG 2014-2723**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1356870 |
| Prep Batch Number: | 1356869 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203012015 | Interference Check Sample (ICS) |
| 1203012011 | Method Blank (MB) |
| 1203012012 | Laboratory Control Sample (LCS) |
| 1203012013 | 339881002(CAMO-14-45694) Matrix Spike (MS) |
| 1203012014 | 339881002(CAMO-14-45694) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
All associated initial calibration verification standards (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 339881002 (CAMO-14-45694) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Most of the listed samples were analyzed three times due to a the bracketing CRI not meeting the necessary acceptance criteria. It was determined after the second analysis, that sample 339880002 (WST59-14-49656) was the cause of the low recovery of Perchlorate-O(18). In the third analysis, three method blanks were analyzed after 339880002, and all samples and QC met acceptance criteria.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2723  GEL Work Order: 339881

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 14 JAN 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-45694

**Date Received:** 24-DEC-13

**GEL Job No (SDG):** 2014-2723

**GEL Sample ID:** 339881002

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.338 | ug/L | | 1 | 07-JAN-14 21:12 | per0107047a |
| | Perchlorate Isotope Ratio | | | 3.2 | | | 1 | 07-JAN-14 21:12 | per0107047a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.325 | ug/L | | 1 | 07-JAN-14 21:12 | per0107047a |
| | Perchlorate-O(18) | | | 0.510 | ug/L | | 1 | 07-JAN-14 21:12 | per0107047a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2014-2723

**Extract Batch Code:** 1356869

**Date Filtered:** 06-JAN-14

**Matrix:** WATER

**Sample ID:** 1203012012

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .188 | ug/L | 93.9 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.15 | | | | - |
| Perchlorate-101 | 0.200 | .18 | ug/L | 90.2 | | 85 - 115 |
| Perchlorate-O(18) | | .477 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2014-2723

**Extract Batch Code:** 1356869

**Date Extracted:** 06-JAN-14

**GEL MS/PS ID:** 1203012013

**Client ID:** CAMO-14-45694

**GEL MSD/PSD ID:** 1203012014

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.338 | ug/L | 0.533 | 97.5 | .527 | 94.4 | 1.14 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.20 | | 3.1 | | 3.15 | | 1.69 | | - |
| Perchlorate-101 | 0.200 | 0.325 | ug/L | 0.530 | 102 | .515 | 94.8 | 2.83 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.510 | ug/L | 0.517 | | .511 | | 1.1 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 06-JAN-14

**GEL Job No (SDG):** 2014-2723

**GEL Sample ID:** 1203012011

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 06-JAN-14 17:32 | per0106012a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 06-JAN-14 17:32 | per0106012a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 06-JAN-14 17:32 | per0106012a |
| | Perchlorate-O(18) | | | 0.478 | ug/L | | 1 | 06-JAN-14 17:32 | per0106012a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 06-JAN-14

**GEL Job No (SDG):** 2014-2723

**GEL Sample ID:** 1203012012

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.188 | ug/L | J | 1 | 06-JAN-14 17:40 | per0106013a |
| | Perchlorate Isotope Ratio | | | 3.15 | | | 1 | 06-JAN-14 17:40 | per0106013a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.180 | ug/L | J | 1 | 06-JAN-14 17:40 | per0106013a |
| | Perchlorate-O(18) | | | 0.477 | ug/L | | 1 | 06-JAN-14 17:40 | per0106013a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2014-2723

**GEL Sample ID:** 1203012015

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.190 | ug/L | J | 1 | 06-JAN-14 17:48 | per0106014a |
| | Perchlorate Isotope Ratio | | | 3.02 | | | 1 | 06-JAN-14 17:48 | per0106014a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.191 | ug/L | J | 1 | 06-JAN-14 17:48 | per0106014a |
| | Perchlorate-O(18) | | | 0.472 | ug/L | | 1 | 06-JAN-14 17:48 | per0106014a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-45694MS

**Date Received:** 24-DEC-13

**GEL Job No (SDG):** 2014-2723

**GEL Sample ID:** 1203012013

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.533 | ug/L | | 1 | 07-JAN-14 21:20 | per0107048a |
| | Perchlorate Isotope Ratio | | | 3.1 | | | 1 | 07-JAN-14 21:20 | per0107048a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.530 | ug/L | | 1 | 07-JAN-14 21:20 | per0107048a |
| | Perchlorate-O(18) | | | 0.517 | ug/L | | 1 | 07-JAN-14 21:20 | per0107048a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1356869

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-45694MSD

**Date Received:** 24-DEC-13

**GEL Job No (SDG):** 2014-2723

**GEL Sample ID:** 1203012014

**Date Filtered:** 06-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.527 | ug/L | | 1 | 07-JAN-14 21:28 | per0107049a |
| | Perchlorate Isotope Ratio | | | 3.15 | | | 1 | 07-JAN-14 21:28 | per0107049a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.515 | ug/L | | 1 | 07-JAN-14 21:28 | per0107049a |
| | Perchlorate-O(18) | | | 0.511 | ug/L | | 1 | 07-JAN-14 21:28 | per0107049a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International (ARSL)**
**SDG 2014-2723**

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203010879 | Method Blank (MB) **ICP** |
| 1203010880 | Laboratory Control Sample (LCS) |
| 1203010883 | 339880001(WST59-14-49655L) Serial Dilution (SD) |
| 1203010881 | 339880001(WST59-14-49655D) Sample Duplicate (DUP) |
| 1203010882 | 339880001(WST59-14-49655S) Matrix Spike (MS) |
| 1203010903 | Method Blank (MB) **ICP-MS** |
| 1203020213 | Method Blank (MB) **ICP-MS** |
| 1203010904 | Laboratory Control Sample (LCS) |
| 1203020214 | Laboratory Control Sample (LCS) |
| 1203010907 | 339880001(WST59-14-49655L) Serial Dilution (SD) |
| 1203020217 | 339880001(WST59-14-49655L) Serial Dilution (SD) |
| 1203010905 | 339880001(WST59-14-49655D) Sample Duplicate (DUP) |
| 1203020215 | 339880001(WST59-14-49655D) Sample Duplicate (DUP) |
| 1203010906 | 339880001(WST59-14-49655S) Matrix Spike (MS) |
| 1203020216 | 339880001(WST59-14-49655S) Matrix Spike (MS) |
| 1203014467 | Method Blank (MB) **CVAA** |
| 1203014468 | Laboratory Control Sample (LCS) |
| 1203014471 | 339880001(WST59-14-49655L) Serial Dilution (SD) |
| 1203014469 | 339880001(WST59-14-49655D) Sample Duplicate (DUP) |
| 1203014470 | 339880001(WST59-14-49655S) Matrix Spike (MS) |

## Method/Analysis Information

| | |
|---|---|
| **Analytical Batch:** | 1356425, 1356446, 1360531, 1357935 and 1360597 |
| **Prep Batch :** | 1356424, 1356445, 1360530 and 1357934 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 27 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B |

**Prep Method :** SW846 3005A and EPA 245.1/245.2 Prep

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**System Configuration**

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

**Calibration Information**

**Instrument Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL Requirements**

The CRDL standard recoveries met the referenced advisory control limits.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blank (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 339880001 (WST59-14-49655)-ICP, CVAA, ICP-MS and ICP-MS.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes, with the exceptions Boron, Cobalt, Copper, Iron, Silica, Cadmium, Molybdenum, Nickel, Silver and Thallium.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL/MDL for CVAA, 50X the IDL/MDL for ICP, and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

**Post Spike (PS) Recovery Statement**
The percent recoveries (%R) obtained from the PS analyses are evaluated when the sample

concentration is less than four times (4X) the spike concentration added. The PS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the absence of matrix interferences in the post-digested sample.

## Technical Information

### Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

### Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

### Sample Dilutions
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instruments. Sample 339881002 required a dilution for Tin in order to minimize suppression due to matrix interferences.

### Preparation Information
The samples in this SDG were prepared exactly according to the cited SOP.

## Miscellaneous Information

### Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DERs were generated for this SDG: 1260739 and 1260535. A copy of each is included in the Miscellaneous Data section of this package.

### Additional Comments

Additional comments were not required for this SDG.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:** Bryan Davis **Date:** 1-20-14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2723  GEL Work Order: 339881

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

J Value is estimated

N Metals--The Matrix spike sample recovery is not within specified control limits

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by Bryan Davis 1-20-14

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−2723 **CONTRACT:** ESHL00210 **METHOD TYPE:** EPA

**SAMPLE ID:** 339881002 **BASIS:** As Received **DATE COLLECTED** 19−DEC−13

**CLIENT ID:** CAMO−14−45694 **LEVEL:** Low **DATE RECEIVED** 24−DEC−13

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 01/08/14 14:24 | 010814W1−8 | 1357935 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−2723 **CONTRACT:** ESHL00210 **METHOD TYPE:** SW846

**SAMPLE ID:** 339881002 **BASIS:** As Received **DATE COLLECTED** 19−DEC−13

**CLIENT ID:** CAMO−14−45694 **LEVEL:** Low **DATE RECEIVED** 24−DEC−13

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | PRB | 01/15/14 21:00 | 140115−6 | 1356446 |
| 7440−38−2 | Arsenic | 2.13 | ug/L | J | 1.7 | 5 | 5 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7440−39−3 | Barium | 25.4 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7440−42−8 | Boron | 16 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 01/07/14 17:55 | 010714A−2 | 1356425 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7440−70−2 | Calcium | 16400 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7440−47−3 | Chromium | 4.33 | ug/L | J | 2 | 10 | 10 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7439−95−4 | Magnesium | 3730 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7439−98−7 | Molybdenum | 1.01 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7440−02−0 | Nickel | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7440−09−7 | Potassium | 1730 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 01/07/14 17:55 | 010714A−2 | 1356425 |
| 7782−49−2 | Selenium | 2.08 | ug/L | J | 1.5 | 5 | 5 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7631−86−9 | Silica | 69900 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 01/07/14 17:55 | 010714A−2 | 1356425 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7440−23−5 | Sodium | 11200 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 01/06/14 19:16 | 010614−4 | 1356425 |
| 7440−24−6 | Strontium | 55.4 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | PRB | 01/20/14 14:37 | 140120−7 | 1360531 |
| 7440−31−5 | Tin | 50 | ug/L | U | 12.5 | 50 | 50 | 5 | P | HSC | 01/16/14 13:00 | 011614A−3 | 1356425 |
| 7440−61−1 | Uranium | 0.463 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | PRB | 01/14/14 19:54 | 140114−5 | 1356446 |
| 7440−62−2 | Vanadium | 6.51 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |
| 7440−66−6 | Zinc | 6.72 | ug/L | J | 3.3 | 10 | 10 | 1 | P | HSC | 01/03/14 21:06 | 010314A−1 | 1356425 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−2723 **CONTRACT:** ESHL00210 **METHOD TYPE:**

**SAMPLE ID:** 339881002 **BASIS:** As Received **DATE COLLECTED** 19−DEC−13

**CLIENT ID:** CAMO−14−45694 **LEVEL:** Low **DATE RECEIVED** 24−DEC−13

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 56.3 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 01/16/14 13:57 | | 1360597 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1356425 | 1356424 | SW846 3005A | 50 | mL | 50 | mL | 12/31/13 | AXG2 |
| 1356446 | 1356445 | SW846 3005A | 50 | mL | 50 | mL | 01/02/14 | AXG2 |
| 1357935 | 1357934 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 01/07/14 | AXS5 |
| 1360531 | 1360530 | SW846 3005A | 50 | mL | 50 | mL | 01/20/14 | AXG2 |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**
**P** **SW846 3005/6010B**
**AV** **EPA 245.1/245.2**

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2014−2723

**Contract:** ESHL00210

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203010879 | | | | | | | | |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 50 | ug/L | +/−150 | U | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 100 | ug/L | +/−300 | U | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| 1203010903 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 2.29 | ug/L | +/−5 | J | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.221 | ug/L | +/−0.5 | J | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203014467 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |
| 1203020213 | | | | | | | | |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |

***Analytical Methods:**

| | |
|---|---|
| **MS** | **SW846 3005/6020 DOE−AL** |
| **P** | **SW846 3005/6010B** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2723 **Client ID** WST59−14−49655S

**Contract:** ESHL00210 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 339880001 **Spike ID:** 1203010882

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 4930 | | 68 | U | 5000 | 97.5 | | P |
| Barium | ug/L | 75−125 | 527 | | 11.4 | | 500 | 103 | | P |
| Beryllium | ug/L | 75−125 | 521 | | 1 | U | 500 | 104 | | P |
| Boron | ug/L | 75−125 | 750 | U | 750 | U | 500 | 0 | N | P |
| Calcium | ug/L | 75−125 | 6030 | | 904 | | 5000 | 102 | | P |
| Cobalt | ug/L | 75−125 | 352 | | 1.13 | J | 500 | 70.2 | N | P |
| Copper | ug/L | 75−125 | 177 | | 3 | U | 500 | 34.9 | N | P |
| Iron | ug/L | 75−125 | 23600 | | 8460 | | 5000 | 304 | N | P |
| Magnesium | ug/L | 75−125 | 5260 | | 110 | U | 5000 | 103 | | P |
| Manganese | ug/L | 75−125 | 462 | | 2 | U | 500 | 92.3 | | P |
| Potassium | ug/L | | 865000 | | 801000 | | 5000 | 1280 | N/A | P |
| Silica | ug/L | 75−125 | 2650 | U | 2650 | U | 10700 | 0 | N | P |
| Sodium | ug/L | | 272000 | | 271000 | | 5000 | 34 | N/A | P |
| Strontium | ug/L | 75−125 | 489 | | 2.16 | J | 500 | 97.4 | | P |
| Tin | ug/L | 75−125 | 429 | | 2.93 | J | 500 | 85.2 | | P |
| Vanadium | ug/L | 75−125 | 427 | | 1.08 | J | 500 | 85.1 | | P |
| Zinc | ug/L | 75−125 | 379 | | 3.3 | U | 500 | 75.4 | | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2723 **Client ID** WST59−14−49655S

**Contract:** ESHL00210 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 339880001 **Spike ID:** 1203010906

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | 75−125 | 38.6 | | 1 | U | 50 | 77 | | MS |
| Arsenic | ug/L | 75−125 | 68.6 | | 15.9 | | 50 | 105 | | MS |
| Cadmium | ug/L | 75−125 | 33.4 | | 0.11 | U | 50 | 66.8 | N | MS |
| Chromium | ug/L | 75−125 | 60 | | 6.82 | J | 50 | 106 | | MS |
| Lead | ug/L | 75−125 | 47.5 | | 0.5 | U | 50 | 94.5 | | MS |
| Molybdenum | ug/L | 75−125 | 34.6 | | 0.31 | J | 50 | 68.7 | N | MS |
| Nickel | ug/L | 75−125 | 36.8 | | 1.12 | J | 50 | 71.4 | N | MS |
| Selenium | ug/L | 75−125 | 118 | | 61.8 | | 50 | 113 | | MS |
| Silver | ug/L | 75−125 | 18.7 | | 0.2 | U | 50 | 37.4 | N | MS |
| Uranium | ug/L | 75−125 | 46 | | 0.228 | | 50 | 91.6 | | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2723 **Client ID** WST59−14−49655S

**Contract:** ESHL00210 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 339880001 **Spike ID:** 1203014470

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 2.19 | | 0.067 | U | 2 | 109 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2723 **Client ID** WST59−14−49655S

**Contract:** ESHL00210 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 339880001 **Spike ID:** 1203020216

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Thallium | ug/L | 75−125 | 19.6 | | 0.45 | U | 50 | 39.1 | N | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2723 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** WST59−14−49655D

**Matrix:** WATER **Level:** Low

**Sample ID:** 339880001 **Duplicate ID:** 1203010881 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 71.1 | J | 200 | | P |
| Barium | ug/L | +/−5 | 11.4 | | 11.6 | | 1.64 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | | 750 | U | 750 | U | | | P |
| Calcium | ug/L | +/−200 | 904 | | 896 | | .869 | | P |
| Cobalt | ug/L | | 1.13 | J | 1 | U | 200 | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | +/−20% | 8460 | | 7700 | | 9.39 | | P |
| Magnesium | ug/L | | 110 | U | 110 | U | | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 801000 | | 830000 | | 3.57 | | P |
| Silica | ug/L | | 2650 | U | 2650 | U | | | P |
| Sodium | ug/L | +/−20% | 271000 | | 273000 | | .861 | | P |
| Strontium | ug/L | +/−5 | 2.16 | J | 2.61 | J | 19 | | P |
| Tin | ug/L | | 2.93 | J | 2.5 | U | 200 | | P |
| Vanadium | ug/L | | 1.08 | J | 1 | U | 200 | | P |
| Zinc | ug/L | | 3.3 | U | 3.3 | U | | | P |

***Analytical Methods:**

**P SW846 3005/6010B**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2723 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** WST59−14−49655D

**Matrix:** WATER **Level:** Low

**Sample ID:** 339880001 **Duplicate ID:** 1203010905 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | +/−5 | 15.9 | | 16.7 | | 4.83 | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | +/−10 | 6.82 | J | 6.42 | J | 6.12 | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 0.31 | J | 0.252 | J | 20.6 | | MS |
| Nickel | ug/L | +/−2 | 1.12 | J | 0.975 | J | 13.9 | | MS |
| Selenium | ug/L | +/−20% | 61.8 | | 66.2 | | 6.79 | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Uranium | ug/L | +/−.2 | 0.228 | | 0.218 | | 4.48 | | MS |

***Analytical Methods:**

**MS SW846 3005/6020 DOE−AL**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2723 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** WST59−14−49655D

**Matrix:** WATER **Level:** Low

**Sample ID:** 339880001 **Duplicate ID:** 1203014469 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2723 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** WST59−14−49655D

**Matrix:** WATER **Level:** Low

**Sample ID:** 339880001 **Duplicate ID:** 1203020215 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |

***Analytical Methods:**

**MS SW846 3005/6020 DOE−AL**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2723

**Contract:** ESHL00210

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203010880 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 5290 | | 106 | 80−120 | P |
| | Barium | ug/L | 500 | 527 | | 105 | 80−120 | P |
| | Beryllium | ug/L | 500 | 526 | | 105 | 80−120 | P |
| | Boron | ug/L | 500 | 504 | | 101 | 80−120 | P |
| | Calcium | ug/L | 5000 | 5300 | | 106 | 80−120 | P |
| | Cobalt | ug/L | 500 | 528 | | 106 | 80−120 | P |
| | Copper | ug/L | 500 | 515 | | 103 | 80−120 | P |
| | Iron | ug/L | 5000 | 5370 | | 107 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 5530 | | 111 | 80−120 | P |
| | Manganese | ug/L | 500 | 518 | | 104 | 80−120 | P |
| | Potassium | ug/L | 5000 | 5180 | | 104 | 80−120 | P |
| | Silica | ug/L | 10700 | 10200 | | 95.4 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5270 | | 105 | 80−120 | P |
| | Strontium | ug/L | 500 | 512 | | 102 | 80−120 | P |
| | Tin | ug/L | 500 | 524 | | 105 | 80−120 | P |
| | Vanadium | ug/L | 500 | 510 | | 102 | 80−120 | P |
| | Zinc | ug/L | 500 | 514 | | 103 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2723

**Contract:** ESHL00210

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203010904 | | | | | | | | |
| | Antimony | ug/L | 50 | 50.8 | | 102 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 48 | | 95.9 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 49.2 | | 98.4 | 80−120 | MS |
| | Chromium | ug/L | 50 | 50.4 | | 101 | 80−120 | MS |
| | Lead | ug/L | 50 | 49.1 | | 98.2 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 48.2 | | 96.3 | 80−120 | MS |
| | Nickel | ug/L | 50 | 48.5 | | 96.9 | 80−120 | MS |
| | Selenium | ug/L | 50 | 52.4 | | 105 | 80−120 | MS |
| | Silver | ug/L | 50 | 50.1 | | 100 | 80−120 | MS |
| | Uranium | ug/L | 50 | 47.8 | | 95.5 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2723

**Contract:** ESHL00210

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203014468 | | | | | | | | |
| | Mercury | ug/L | 2 | 2.2 | | 110 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2723

**Contract:** ESHL00210

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203020214 | | | | | | | | |
| | Thallium | ug/L | 50 | 40.2 | | 80.5 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2723 **Client ID** WST59−14−49655L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 339880001 **Serial Dilution ID:** 1203010883

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 11.4 | | 11.7 | J | 2.39 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 15 | U | 75 | U | | | | P |
| Calcium | 904 | | 865 | J | 4.4 | | | P |
| Cobalt | 1.13 | J | 5 | U | 100 | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 8460 | | 8340 | | 1.34 | | 10 | P |
| Magnesium | 110 | U | 550 | U | | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 16000 | | 16400 | | 2.51 | | 10 | P |
| Silica | 53 | U | 265 | U | | | | P |
| Sodium | 271000 | | 257000 | | 5.35 | | 10 | P |
| Strontium | 2.16 | J | 5 | U | 100 | | | P |
| Tin | 2.93 | J | 12.5 | U | 100 | | | P |
| Vanadium | 1.08 | J | 5 | U | 100 | | | P |
| Zinc | 3.3 | U | 16.5 | U | | | | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2723 **Client ID** WST59−14−49655L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 339880001 **Serial Dilution ID:** 1203010907

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 15.9 | | 22.2 | J | 39.5 | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 6.82 | J | 11.2 | J | 63.5 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | .31 | J | .825 | U | 100 | | | MS |
| Nickel | 1.12 | J | 2.5 | U | 100 | | | MS |
| Selenium | 61.8 | | 64.2 | | 3.9 | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Uranium | .228 | | .335 | U | 100 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2723 **Client ID** WST59−14−49655L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 339880001 **Serial Dilution ID:** 1203014471

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2723 **Client ID** WST59−14−49655L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 339880001 **Serial Dilution ID:** 1203020217

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Thallium | .45 | U | 2.25 | U | | | | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 16-JAN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ICP/MS | SW846 3005/6020 DOE-AL | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1356446 | See Below | | |

**Potentially affected work order(s)(SDG): 339880(2014-2724),339881(2014-2723)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203010906MS | The matrix spike recovery failed outside of the control limits for Cd, Mo, Ni and Ag due to possible matrix interferences and/or sample non-homogeneity. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported. |

**Originator's Name:**

Paul Boyd 17-JAN-14

**Data Validator/Group Leader:**

Samantha Jacobs 17-JAN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 17-JAN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ICP | SW846 3005/6010B | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1356425 | See Below | | |

**Potentially affected work order(s)(SDG): 339880(2014-2724),339881(2014-2723)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203010882MS | 1. The matrix spike recovery failed outside of the control limits for cobalt, copper, iron, boron and silica due to possible matrix interferences and/or non-homogeneity. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported.<br><br>Sample #339880001 had black particles that settles down in the bottom of container. |

**Originator's Name:**

Helen Camello 17-JAN-14

**Data Validator/Group Leader:**

Theresa McKelvey 20-JAN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 20-JAN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ICP/MS | SW846 3005/6020 DOE-AL | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1360531 | See Below | | |

**Potentially affected work order(s)(SDG): 339880(2014-2724),339881(2014-2723)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203020216MS | The matrix spike recovery failed outside of the control limits for Tl due to possible matrix interferences and/or sample non-homogeneity. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported. |

**Originator's Name:**

Paul Boyd 20-JAN-14

**Data Validator/Group Leader:**

Elizabeth Janssen 20-JAN-14

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International (ARSL)**
**SDG 2014-2723**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1357248 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 339881001 | CAMO-14-45690 |
| 1203013032 | Method Blank (MB) |
| 1203013033 | 339720001(CAWA-14-46038) Sample Duplicate (DUP) |
| 1203013035 | 339720001(CAWA-14-46038) Post Spike (PS) |
| 1203013037 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339720001 (CAWA-14-46038).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed to verify the result: 339881001 (CAMO-14-45690).

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1357945 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203014506 | Laboratory Control Sample (LCS) |
| 1203014507 | 339632014(CAPA-14-49425) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Conductivity analysis was performed on a Orion 160 Conductivity Meter.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339632014 (CAPA-14-49425).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1357003 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203012399 | 339720008(CAWA-14-46042) Sample Duplicate (DUP) |
| 1203012402 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Electrode analysis was performed on a PerpHect pH Meter Orion 370.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 339720008 (CAWA-14-46042).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
The following sample from this sample group was received by the lab outside of the method specified holding time: 339881002 (CAMO-14-45694).

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1256115 339881002 (CAMO-14-45694).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1357049 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1357048 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 339881001 | CAMO-14-45690 |
| 1203012509 | Method Blank (MB) |
| 1203012510 | 339881001(CAMO-14-45690) Sample Duplicate (DUP) |
| 1203012513 | 339881001(CAMO-14-45690) Matrix Spike (MS) |
| 1203012517 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339881001 (CAMO-14-45690).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203012513 (CAMO-14-45690).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203012510 (CAMO-14-45690).

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203012509 (MB), 1203012510 (CAMO-14-45690), 1203012513 (CAMO-14-45690), 1203012517 (LCS) and 339881001 (CAMO-14-45690).

## Miscellaneous Information

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1256641 1203012510 (CAMO-14-45690) and 1203012513 (CAMO-14-45690).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages

electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1356558 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203011177 | Method Blank (MB) |
| 1203011178 | 339881002(CAMO-14-45694) Sample Duplicate (DUP) |
| 1203011179 | 339881002(CAMO-14-45694) Post Spike (PS) |
| 1203011180 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 22.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339881002 (CAMO-14-45694).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203011178 (CAMO-14-45694), 1203011179 (CAMO-14-45694) and 339881002 (CAMO-14-45694).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1356392 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1356391 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203010816 | Method Blank (MB) |
| 1203010817 | 339881002(CAMO-14-45694) Sample Duplicate (DUP) |
| 1203010819 | 339881002(CAMO-14-45694) Matrix Spike (MS) |
| 1203010821 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339881002 (CAMO-14-45694).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203010819 (CAMO-14-45694).

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203010817 (CAMO-14-45694).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1255319 1203010819 (CAMO-14-45694).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1357047 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1357046 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 339881001 | CAMO-14-45690 |
| 1203012498 | Method Blank (MB) |
| 1203012499 | 339881001(CAMO-14-45690) Sample Duplicate (DUP) |
| 1203012500 | 339881001(CAMO-14-45690) Matrix Spike (MS) |
| 1203012501 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339881001 (CAMO-14-45690).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203012499 (CAMO-14-45690).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1356403 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203010836 | Method Blank (MB) |
| 1203010840 | 339881002(CAMO-14-45694) Sample Duplicate (DUP) |
| 1203010844 | 339881002(CAMO-14-45694) Post Spike (PS) |
| 1203010845 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339881002 (CAMO-14-45694).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203010844 (CAMO-14-45694).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1256261 1203010844 (CAMO-14-45694).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1357042 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1357041 | **Method:** | EEPA 365.4 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203012490 | Method Blank (MB) |
| 1203012491 | Laboratory Control Sample (LCS) |
| 1203012492 | 339880002(WST59-14-49656) Sample Duplicate (DUP) |
| 1203012493 | 339880002(WST59-14-49656) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339880002 (WST59-14-49656).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The sample concentration is more than four times the spike nominal concentration; therefore, the spike recovery is not applicable. 1203012493 (WST59-14-49656).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203012492 (WST59-14-49656) and 1203012493 (WST59-14-49656).

**Sample Re-analysis**
The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203012490 (MB), 1203012491 (LCS), 1203012492 (WST59-14-49656), 1203012493 (WST59-14-49656) and 339881002 (CAMO-14-45694).

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1356318 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203010647 | Method Blank (MB) |
| 1203010648 | 339881002(CAMO-14-45694) Sample Duplicate (DUP) |
| 1203010649 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 339881002 (CAMO-14-45694).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1357057 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 339881002 | CAMO-14-45694 |
| 1203012528 | Method Blank (MB) |
| 1203012529 | Laboratory Control Sample (LCS) |
| 1203012532 | 339880002(WST59-14-49656) Sample Duplicate (DUP) |
| 1203012533 | 339880002(WST59-14-49656) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 339880002 (WST59-14-49656).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____20Jan14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2723  GEL Work Order: 339881

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

H  Analytical holding time was exceeded

J  Value is estimated

N  Metals--The Matrix spike sample recovery is not within specified control limits

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 20, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2014-2723

Client Sample ID: CAMO-14-45690
Sample ID: 339881001
Matrix: W
Collect Date: 19-DEC-13 11:21
Receive Date: 24-DEC-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | U | ND | 0.330 | 1.00 | mg/L | 1 | TSM | 01/06/14 | 1352 | 1357248 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | | 16.8 | 1.67 | 5.00 | ug/L | 1 | KLP1 | 01/02/14 | 1415 | 1357049 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1 | KLP1 | 01/03/14 | 1004 | 1357047 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | MXV1 | 01/02/14 | 1230 | 1357048 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | MXV1 | 01/02/14 | 1700 | 1357046 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 20, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2014-2723

Client Sample ID: CAMO-14-45694
Sample ID: 339881002
Matrix: W
Collect Date: 19-DEC-13 11:21
Receive Date: 24-DEC-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conductivity Analysis | | | | | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 157 | 1.00 | 1.00 | umhos/cm | 1 | LXA1 | 01/07/14 | 1600 | 1357945 | 1 |
| Electrode Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 11.5C | H | 8.14 | 0.010 | 0.100 | SU | 1 | LYG1 | 12/31/13 | 0751 | 1357003 | 2 |
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | 1 | DM | 12/30/13 | 1915 | 1356558 | 3 |
| Chloride | | 2.45 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.305 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 2.40 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | J | 0.0423 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 12/27/13 | 1237 | 1356392 | 4 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.938 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 12/31/13 | 1501 | 1356403 | 5 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | J | 0.0358 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 01/03/14 | 1206 | 1357042 | 6 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 131 | 3.40 | 14.3 | mg/L | | LYG1 | 12/26/13 | 0856 | 1356318 | 7 |
| Titration Analysis | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 76.1 | 0.725 | 1.00 | mg/L | | LXA1 | 12/31/13 | 1645 | 1357057 | 8 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | MXV1 | 12/27/13 | 1100 | 1356391 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | MXV1 | 01/02/14 | 1700 | 1357041 |

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: January 20, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2014-2723 |
| Project: | LANL-WQH Water Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAMO-14-45694 | Project: | ESHL00210 |
| Sample ID: | 339881002 | Client ID: | ARSL001 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 120.1 | |
| 2 | EPA 150.1 | |
| 3 | EPA 300.0 | |
| 4 | EPA 350.1 | |
| 5 | EPA 353.2 | |
| 6 | EPA 365.4 | |
| 7 | EPA 160.1 | |
| 8 | EPA 310.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

**Report Date: January 20, 2014**



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **339881**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | |
| Batch 1357248 | | | | | | | | | | | |
| QC1203013033 339720001 DUP | | | | | | | | | | | |
| Total Organic Carbon Average | | J | 0.645 | J | 0.554 | mg/L | 15.2 ^ | | (+/-1.00) | TSM | 01/03/14 14:21 |
| QC1203013037 LCS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 9.70 | mg/L | | 97 | (85%-115%) | | 01/03/14 12:31 |
| QC1203013032 MB | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | 01/03/14 12:22 |
| QC1203013035 339720001 PS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | J | 0.645 | | 10.7 | mg/L | | 101 | (65%-120%) | | 01/03/14 14:40 |
| **Conductivity Analysis** | | | | | | | | | | | |
| Batch 1357945 | | | | | | | | | | | |
| QC1203014507 339632014 DUP | | | | | | | | | | | |
| Conductivity | | | 129 | | 133 | umhos/cm | 2.60 | | (0%-10%) | LXA1 | 01/07/14 15:56 |
| QC1203014506 LCS | | | | | | | | | | | |
| Conductivity | 1410 | | | | 1420 | umhos/cm | | 101 | (95%-105%) | | 01/07/14 15:53 |
| **Electrode Analysis** | | | | | | | | | | | |
| Batch 1357003 | | | | | | | | | | | |
| QC1203012399 339720008 DUP | | | | | | | | | | | |
| pH | | H | 8.48 | H | 8.49 | SU | 0.118 | | (0%-10%) | LYG1 | 12/31/13 07:40 |
| QC1203012402 LCS | | | | | | | | | | | |
| pH | 7.00 | | | | 7.02 | SU | | 100 | (99%-101%) | | 12/31/13 07:36 |
| **Flow Injection Analysis** | | | | | | | | | | | |
| Batch 1357049 | | | | | | | | | | | |
| QC1203012510 339881001 DUP | | | | | | | | | | | |
| Cyanide, Total | | | 16.8 | J | 2.84 | ug/L | 142*^ | | (+/-5.00) | KLP1 | 01/02/14 14:16 |
| QC1203012517 LCS | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 46.0 | ug/L | | 92 | (90%-110%) | | 01/02/14 14:12 |
| QC1203012509 MB | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | 01/02/14 14:11 |
| QC1203012513 339881001 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | | 16.8 | | 80.7 | ug/L | | 63.9* | (90%-110%) | | 01/02/14 14:17 |
| **Ion Chromatography** | | | | | | | | | | | |

## QC Summary

**Workorder:** **339881**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | | |
| Batch 1356558 | | | | | | | | | | | | |
| QC1203011178 339881002 DUP | | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | | DM | 12/30/13 19:46 |
| Chloride | | | 2.45 | | 2.44 | mg/L | 0.434 | | | (0%-20%) | | |
| Fluoride | | | 0.305 | | 0.305 | mg/L | 0.0983 | ^ | | (+/-0.100) | | |
| Sulfate | | | 2.40 | | 2.78 | mg/L | 14.8 | | | (0%-20%) | | |
| QC1203011180 LCS | | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.29 | mg/L | | | 103 | (90%-110%) | | 12/30/13 17:40 |
| Chloride | 5.00 | | | | 4.96 | mg/L | | | 99.3 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.55 | mg/L | | | 102 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 10.3 | mg/L | | | 103 | (90%-110%) | | |
| QC1203011177 MB | | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | | 12/30/13 17:09 |
| Chloride | | | | U | ND | mg/L | | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | | |
| QC1203011179 339881002 PS | | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.33 | mg/L | | | 106 | (90%-110%) | | 12/30/13 20:17 |
| Chloride | 5.00 | | 2.45 | | 7.61 | mg/L | | | 103 | (90%-110%) | | |
| Fluoride | 2.50 | | 0.305 | | 2.83 | mg/L | | | 101 | (90%-110%) | | |
| Sulfate | 10.0 | | 2.40 | | 13.1 | mg/L | | | 107 | (90%-110%) | | |
| **Nutrient Analysis** | | | | | | | | | | | | |
| Batch 1356392 | | | | | | | | | | | | |
| QC1203010817 339881002 DUP | | | | | | | | | | | | |
| Nitrogen, Ammonia | | J | 0.0423 | U | ND | mg/L | 200 | ^ | | | KLP1 | 12/27/13 12:38 |
| QC1203010821 LCS | | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 1.04 | mg/L | | | 104 | (90%-110%) | | 12/27/13 12:23 |
| QC1203010816 MB | | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | J | 0.0225 | mg/L | | | | | | 12/27/13 12:22 |

## QC Summary

**Workorder:** **339881**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1356392 | | | | | | | | | | | |
| QC1203010819 339881002 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | J | 0.0423 | | 0.817 | mg/L | | 77.5* | (90%-110%) | KLP1 | 12/27/13 12:39 |
| Batch 1356403 | | | | | | | | | | | |
| QC1203010840 339881002 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 0.938 | | 0.942 | mg/L | 0.426 | | (0%-20%) | KLP1 | 12/31/13 15:02 |
| QC1203010845 LCS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 1.06 | mg/L | | 106 | (90%-110%) | | 12/31/13 14:25 |
| QC1203010836 MB | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | | U | ND | mg/L | | | | | 12/31/13 14:20 |
| QC1203010844 339881002 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.938 | | 1.83 | mg/L | | 89.2* | (90%-110%) | | 12/31/13 15:04 |
| Batch 1357042 | | | | | | | | | | | |
| QC1203012492 339880002 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | | 163 | | 165 | mg/L | 1.22 | | (0%-20%) | KLP1 | 01/03/14 12:04 |
| QC1203012491 LCS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 0.970 | mg/L | | 97 | (79%-126%) | | 01/03/14 12:02 |
| QC1203012490 MB | | | | | | | | | | | |
| Phosphorus, Total as P | | | | U | ND | mg/L | | | | | 01/03/14 12:02 |
| QC1203012493 339880002 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | 163 | | 156 | mg/L | | N/A | (64%-134%) | | 01/03/14 12:05 |
| Batch 1357047 | | | | | | | | | | | |
| QC1203012499 339881001 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | | KLP1 | 01/03/14 10:05 |
| QC1203012501 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 1.00 | mg/L | | 100 | (90%-110%) | | 01/03/14 10:02 |
| QC1203012498 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | U | ND | mg/L | | | | | 01/03/14 10:01 |
| QC1203012500 339881001 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 1.06 | mg/L | | 106 | (90%-110%) | | 01/03/14 10:06 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1356318 | | | | | | | | | | | |
| QC1203010648 339881002 DUP | | | | | | | | | | | |

## QC Summary

**Workorder:** **339881**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Solids Analysis** | | | | | | | | | | |
| Batch 1356318 | | | | | | | | | | |
| Total Dissolved Solids | | 131 | | 131 | mg/L | 0.00 | | (0%-10%) | LYG1 | 12/26/13 08:56 |
| QC1203010649 LCS | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | 286 | mg/L | | 95.2 | (95%-105%) | | 12/26/13 08:56 |
| QC1203010647 MB | | | | | | | | | | |
| Total Dissolved Solids | | | U | ND | mg/L | | | | | 12/26/13 08:56 |
| **Titration Analysis** | | | | | | | | | | |
| Batch 1357057 | | | | | | | | | | |
| QC1203012532 339880002 DUP | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 481 | | 480 | mg/L | 0.220 | | (0%-20%) | LXA1 | 12/31/13 16:40 |
| Carbonate alkalinity (CaCO3) | U | ND | U | ND | mg/L | N/A | | | | |
| QC1203012529 LCS | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | 51.8 | mg/L | | 104 | (90%-110%) | | 12/31/13 12:07 |
| QC1203012528 MB | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | U | ND | mg/L | | | | | 12/31/13 12:05 |
| Carbonate alkalinity (CaCO3) | | | U | ND | mg/L | | | | | |
| QC1203012533 339880002 MS | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | 481 | | 529 | mg/L | | N/A | (80%-120%) | | 12/31/13 16:42 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |

## QC Summary

**Workorder:** **339881**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 27-DEC-13 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 350.1, EPA 350.1 SC | Liquid | ALBR, DPNT, ESHL, ORNL, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1356392 | See Below | | |

**Potentially affected work order(s)(SDG): 339874,339875,339876,339880(2014-2724),339881(2014-2723),339890,339911,339924(13125823)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS:<br><br>QC 1203010820MS<br><br>2.Failed Recovery for MS:<br><br>QC 1203010819MS | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference:<br>1203010820<br><br>2.The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.<br>1203010819 |

**Originator's Name:**

Kristen Parson 27-DEC-13

**Data Validator/Group Leader:**

Elzbieta Szulc 30-DEC-13

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 31-DEC-13 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ELECTRODE | EPA 150.1, SM 4500-H B, SW846 9040C | Liquid | CARE, ESHL, OLAB, VCSU |
| **Batch ID:** | **Sample Numbers:** | | |
| 1357003 | See Below | | |

**Potentially affected work order(s)(SDG):** **339212,339720(2014-2709),339818(EUI-9499),339826(EUI-9503),339880(2014-2724),339881(2014-2723),339974(EUI-9510),339981(X312259)**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Sample received out of holding:<br>339212 001,002,003<br>339720 008,011,015,016<br>339818 001<br>339826 001<br>339880 002<br>339881 002<br>339974 001<br>339981 001 | 1. Sample received out of holding |

**Originator's Name:**
Lisa Gregory 31-DEC-13

**Data Validator/Group Leader:**
Elzbieta Szulc 02-JAN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 31-DEC-13 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 353.2 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1356403 | See Below | | |

**Potentially affected work order(s)(SDG): 339422,339491,339524,339586,339880(2014-2724),339881(2014-2723)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for PS:<br><br>QC 1203010844PS | 1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. |

**Originator's Name:**

Kristen Parson 31-DEC-13

**Data Validator/Group Leader:**

Elzbieta Szulc 09-JAN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 02-JAN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 335.4, SW846 9012B | Liquid | CARE, ESHL, UCOR |
| **Batch ID:** | **Sample Numbers:** | | |
| 1357049 | See Below | | |

**Potentially affected work order(s)(SDG): 339880(2014-2724),339881(2014-2723),339888,339974(EUI-9510),340014,340016**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Failed RPD for DUP

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS:<br>QC 1203012513MS,1203012514MS,<br>1203012515MS | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference. |
| 2. Failed RPD for DUP:<br>QC 1203012510DUP | 2. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |
| 3. Failed RPD for MS/MSD:<br>QC 1203012516MSD | 3. The Relative Percent Difference (RPD) between the spike and spike duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |
| 4. Failed Recovery for MSD:<br>QC 1203012516MSD | 4. The spike duplicate recovery falls outside of the established acceptance limits due to matrix interference. |

**Originator's Name:**

Kristen Parson 02-JAN-14

**Data Validator/Group Leader:**

Elzbieta Szulc 03-JAN-14

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

COC/Lab Request #: 2014-2789



**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:**

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-53218 | Jan 17 2014 | 12:04 | W | 1 | | 1 | | | 1 |
| CAMO-14-53219 | Jan 17 2014 | 12:04 | W | | 1 | | 1 | 1 | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 1/21/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4525

**EVENT NAME:** Mortandad/Sandia (General Surveillance) MY2014 Q2 Watershed Sampling_Mortandad

**SAMPLE ID:** CAMO-14-53218

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 1/17/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1204 | MEDIA: | UA | ✓ |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | GSP |
| LOCATION ID: | R-34 | ✓ | FIELD PREP: | UF | OK |
| LOCATION TYPE: | MON | ✓ | FIELD QC TYPE: | REG | ✓ |
| PORT: | SINGLE COMPLETION | ✓ | SAMPLE USAGE: | INV | ✓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | N/A |
| ✓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ✓ | ✓ |
| ✓ | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | ✓ | ✓ |

**SAMPLE COMMENTS:** Diesel generator running while sampling

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.01 mg/L  Flow (in gpm) 2.8 GPM  Oxidation-Reduction Potential -67.6 mV

pH 8.25 SU  Specific Conductance 153 uS/cm  Temperature 20.55 deg C

Turbidity 0.8 NTU

**COLLECTED BY (PRINT)** J Maze

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| William Shaw | 1/17/14 12:50 | Sheri Sherwood | 1/17/14 12:50 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
| | | | |

Report Date 01/06/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4525

**EVENT NAME:** Mortandad/Sandia (General Surveillance) MY2014 Q2 Watershed Sampling_Mortandad

**SAMPLE ID:** CAMO-14-53219

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 1/7/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1204 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | GSP |
| LOCATION ID: | R-34 | | FIELD PREP: | F | ok |
| LOCATION TYPE: | MON | | FIELD QC TYPE: | REG | |
| PORT: | SINGLE COMPLETION | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | N/A |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** J Maze

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| William Shea | 1/7/14 1250 | S. Sherwood | 1/7/14 1250 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 01/06/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-2789

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 341747 | EPA:120.1 | 1 | | | | |
| 341747 | EPA:150.1 | 1 | | | | |
| 341747 | EPA:160.1 | 1 | | | | |
| 341747 | EPA:245.2 | 2 | | | | |
| 341747 | EPA:300.0 | 1 | | | | |
| 341747 | EPA:310.1 | 1 | | | | |
| 341747 | EPA:335.4 | 1 | | | | |
| 341747 | EPA:350.1 | 1 | | | | |
| 341747 | EPA:351.2 | 1 | | | | |
| 341747 | EPA:353.2 | 1 | | | | |
| 341747 | EPA:365.4 | 1 | | | | |
| 341747 | SM:A2340B | 1 | | | | |
| 341747 | SW-846:6010B | 1 | | | | |
| 341747 | SW-846:6020 | 1 | | | | |
| 341747 | SW-846:6850 | 1 | | | | |
| 341747 | SW-846:9060 | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 341747 | EPA:120.1 | 1364190 | 1364190 | 1 | | | | | | | | | | 1 | | | | 2 | | | |
| 341747 | EPA:150.1 | 1364179 | 1364179 | 1 | | | | | | | | | | 1 | | | | 2 | | | |
| 341747 | EPA:160.1 | 1362084 | 1362084 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 341747 | EPA:245.2 | 1364464 | 1364463 | 2 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | EPA:300.0 | 1361948 | 1361948 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 341747 | EPA:310.1 | 1363236 | 1363236 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | EPA:335.4 | 1362344 | 1362343 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | EPA:350.1 | 1361777 | 1361776 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 341747 | EPA:351.2 | 1362820 | 1362819 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | EPA:353.2 | 1361186 | 1361186 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 341747 | EPA:365.4 | 1362816 | 1362815 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | SM:A2340B | 1367060 | 1367060 | 1 | | | | | | | | | | | | | | | | | |
| 341747 | SW-846:6010B | 1361878 | 1361877 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | SW-846:6020 | 1361880 | 1361879 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | SW-846:6850 | 1362962 | 1362961 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 341747 | SW-846:9060 | 1362902 | 1362902 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-14-49662 | 1203029712 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CASA-14-49694 | 1203029713 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203029714 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-14-49662 | 1203029691 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CASA-14-49695 | 1203029690 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203029692 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CASA-14-49694 | 1203024141 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203024144 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203024140 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-53218 | 341747001 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CASA-14-49690 | 1203030353 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CASA-14-49690 | 1203030354 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203030352 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203030351 | MB | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-53219 | 1203023764 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203023766 | LCS | 0 | 0 | 4 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203023763 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CASA-14-49694 | 1203027149 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CASA-14-49694 | 1203027150 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203027144 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203027143 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-14-53218 | 341747001 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CASA-14-49688 | 1203024842 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CASA-14-49688 | 1203024844 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203024846 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203024841 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CASA-14-49695 | 1203023328 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CASA-14-49695 | 1203023330 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203023332 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203023327 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-53218 | 341747001 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-147-49672 | 1203026087 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-147-49672 | 1203026088 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203026086 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203026085 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203021939 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203021934 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | WST00-14-53823 | 1203021935 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-147-49683 | 1203026075 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-147-49683 | 1203026076 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203026074 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203026073 | MB | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CAMO-14-53219 | 1203023596 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CAMO-14-53219 | 1203023597 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC | CAMO-14-53219 | 341747002 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | LCS | 1203023595 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC | MB | 1203023594 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-53219 | 341747002 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CASA-14-49694 | 1203023601 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CASA-14-49694 | 1203023602 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203023600 | LCS | 0 | 0 | 11 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:6020 | INORGANIC | MB | 1203023599 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-53818 | 1203026449 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-53818 | 1203026450 | MSD | 0 | 0 | 1 | 0 |
| [illegible] | LCMS/MS PERCHLORATE | LCS | [illegible] | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203026447 | MB | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-14-49660 | 1203026289 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-14-53218 | 341747001 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CASA-14-49691 | 1203026290 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203026293 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203026288 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203023594 | METHOD BLANK | SW-846:6010B | W | Barium | 2 | J | ug/L | 5.00 |
| MB | 1203023594 | METHOD BLANK | SW-846:6010B | W | Potassium | -67.7 | J | ug/L | 150 |
| MB | 1203023594 | METHOD BLANK | SW-846:6010B | W | Strontium | -2 | J | ug/L | 5.00 |
| MB | 1203023599 | METHOD BLANK | SW-846:6020 | W | Molybdenum | .217 | J | ug/L | 0.500 |

# DATA VALIDATION REPORT

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-53219 | 1203023594 | METHOD BLANK | SW-846:6010B | Potassium | -67.7 | ug/L | 1580 | | 150 | Y | 5 | | Y |
| CAMO-14-53219 | 1203023594 | METHOD BLANK | SW-846:6010B | Strontium | -2 | ug/L | 56.4 | | 5.00 | Y | 5 | | Y |

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

| Field Sample ID | Lab Sample ID | LD Lab Sample ID | Analytical Method | Parameter Name | Sample Matrix | Lab Result | LD Lab Result | Lab Units | Detect Flag | LD Detect Flag | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-53219 | 341747002 | 1203023764 | EPA:300.0 | Chloride | W | 2.42 | 2.41 | mg/L | Y | Y | .236 | 0 |
| CAMO-14-53219 | 341747002 | 1203023764 | EPA:300.0 | Fluoride | W | 0.297 | 0.309 | mg/L | Y | Y | 4.06 | 0 |
| CAMO-14-53219 | 341747002 | 1203023764 | EPA:300.0 | Sulfate | W | 2.85 | 2.85 | mg/L | Y | Y | .256 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Barium | W | 25.4 | 25.6 | ug/L | Y | Y | 0.439 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Calcium | W | 15700 | 15500 | ug/L | Y | Y | 1.17 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Magnesium | W | 3650 | 3530 | ug/L | Y | Y | 3.31 | 0 |

# DATA VALIDATION REPORT

| Field Sample ID | Lab Sample ID | LD Lab Sample ID | Analytical Method | Parameter Name | Sample Matrix | Lab Result | LD Lab Result | Lab Units | Detect Flag | LD Detect Flag | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Potassium | W | 1580 | 1580 | ug/L | Y | Y | 0.538 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Silicon Dioxide | W | 68500 | 67500 | ug/L | Y | Y | 1.58 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Sodium | W | 11300 | 11200 | ug/L | Y | Y | 0.541 | 0 |
| CAMO-14-53219 | 341747002 | [illegible] | SW-846:6010B | [illegible] | W | 56.4 | 55.9 | ug/L | Y | Y | 0.892 | [illegible] |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Vanadium | W | 7.4 | 6.83 | ug/L | Y | Y | 8.01 | 0 |

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | INORGANIC | SW-846:6010B | Barium | | J | I10a | Y | 25.4 | ug/L | 25.4 | ug/L | | | W | 01/17/2014 | | 1361878 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | INORGANIC | SW-846:6010B | Calcium | | J | I10a | Y | 15700 | ug/L | 15.7 | mg/L | | | W | 01/17/2014 | | 1361878 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | GENERAL CHEMISTRY | EPA:300.0 | Chloride | | J | I10a | Y | 2.42 | mg/L | 2.42 | mg/L | | | W | 01/17/2014 | | 1361948 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | GENERAL CHEMISTRY | EPA:300.0 | Fluoride | | J | I10a | Y | 0.297 | mg/L | 0.297 | mg/L | | | W | 01/17/2014 | | 1361948 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | INORGANIC | SW-846:6010B | Magnesium | | J | I10a | Y | 3650 | ug/L | 3.65 | mg/L | | | W | 01/17/2014 | | 1361878 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | INORGANIC | SW-846:6010B | Potassium | | J | I10a | Y | 1580 | ug/L | 1.58 | mg/L | | | W | 01/17/2014 | | 1361878 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | INORGANIC | SW-846:6010B | Silicon Dioxide | | J | I10a | Y | 68500 | ug/L | 68.5 | mg/L | | | W | 01/17/2014 | | 1361878 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | INORGANIC | SW-846:6010B | Sodium | | J | I10a | Y | 11300 | ug/L | 11.3 | mg/L | | | W | 01/17/2014 | | 1361878 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | INORGANIC | SW-846:6010B | Strontium | | J | I10a | Y | 56.4 | ug/L | 56.4 | ug/L | | | W | 01/17/2014 | | 1361878 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | GENERAL CHEMISTRY | EPA:300.0 | Sulfate | | J | I10a | Y | 2.85 | mg/L | 2.85 | mg/L | | | W | 01/17/2014 | | 1361948 | VAL | Y |
| R-34 | 2014-2789 | CAMO-14-53219 | REG | INIT | INORGANIC | SW-846:6010B | Vanadium | | J | I10a | Y | 7.4 | ug/L | 7.4 | ug/L | | | W | 01/17/2014 | | 1361878 | VAL | Y |

| Reason Code | Description |
|---|---|
| I10a | The sample and the duplicate sample results were >=5X the RL and the duplicate RPD was >20% for water samples and >35% for soil samples. |
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |

# DATA VALIDATION REPORT

| Reason Code | Description |
|---|---|
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAMO-14-53218 | R-34 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-53218 | R-34 | REG | EPA:335.4 | 0 | 1 |
| CAMO-14-53218 | R-34 | REG | EPA:351.2 | 0 | 1 |
| CAMO-14-53218 | R-34 | REG | SW-846:9060 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:120.1 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:150.1 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:160.1 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:300.0 | 0 | 4 |
| CAMO-14-53219 | R-34 | REG | EPA:310.1 | 0 | 2 |
| CAMO-14-53219 | R-34 | REG | EPA:350.1 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:353.2 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:365.4 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | SM:A2340B | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | SW-846:6010B | 0 | 17 |
| CAMO-14-53219 | R-34 | REG | SW-846:6020 | 0 | 11 |
| CAMO-14-53219 | R-34 | REG | SW-846:6850 | 0 | 1 |

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-2789

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 341747 | EPA:120.1 | 1 | | | | |
| 341747 | EPA:150.1 | 1 | | | | |
| 341747 | EPA:160.1 | 1 | | | | |
| 341747 | EPA:245.2 | 2 | | | | |
| 341747 | EPA:300.0 | 1 | | | | |
| 341747 | EPA:310.1 | 1 | | | | |
| 341747 | EPA:335.4 | 1 | | | | |
| 341747 | EPA:350.1 | 1 | | | | |
| 341747 | EPA:351.2 | 1 | | | | |
| 341747 | EPA:353.2 | 1 | | | | |
| 341747 | EPA:365.4 | 1 | | | | |
| 341747 | SM:A2340B | 1 | | | | |
| 341747 | SW-846:6010B | 1 | | | | |
| 341747 | SW-846:6020 | 1 | | | | |
| 341747 | SW-846:6850 | 1 | | | | |
| 341747 | SW-846:9060 | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 341747 | EPA:120.1 | 1364190 | 1364190 | 1 | | | | | | | | | | 1 | | | | 2 | | | |
| 341747 | EPA:150.1 | 1364179 | 1364179 | 1 | | | | | | | | | | 1 | | | | 2 | | | |
| 341747 | EPA:160.1 | 1362084 | 1362084 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 341747 | EPA:245.2 | 1364464 | 1364463 | 2 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | EPA:300.0 | 1361948 | 1361948 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 341747 | EPA:310.1 | 1363236 | 1363236 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | EPA:335.4 | 1362344 | 1362343 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | EPA:350.1 | 1361777 | 1361776 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 341747 | EPA:351.2 | 1362820 | 1362819 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | EPA:353.2 | 1361186 | 1361186 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 341747 | EPA:365.4 | 1362816 | 1362815 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | SM:A2340B | 1367060 | 1367060 | 1 | | | | | | | | | | | | | | | | | |
| 341747 | SW-846:6010B | 1361878 | 1361877 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | SW-846:6020 | 1361880 | 1361879 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 341747 | SW-846:6850 | 1362962 | 1362961 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 341747 | SW-846:9060 | 1362902 | 1362902 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-14-49662 | 1203029712 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CASA-14-49694 | 1203029713 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203029714 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-14-49662 | 1203029691 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CASA-14-49695 | 1203029690 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203029692 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CASA-14-49694 | 1203024141 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203024144 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203024140 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-53218 | 341747001 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CASA-14-49690 | 1203030353 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CASA-14-49690 | 1203030354 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203030352 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203030351 | MB | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-53219 | 1203023764 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203023766 | LCS | 0 | 0 | 4 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203023763 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CASA-14-49694 | 1203027149 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CASA-14-49694 | 1203027150 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203027144 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203027143 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-14-53218 | 341747001 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CASA-14-49688 | 1203024842 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CASA-14-49688 | 1203024844 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203024846 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203024841 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CASA-14-49695 | 1203023328 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CASA-14-49695 | 1203023330 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203023332 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203023327 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-53218 | 341747001 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-147-49672 | 1203026087 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-147-49672 | 1203026088 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203026086 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203026085 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203021939 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203021934 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | WST00-14-53823 | 1203021935 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-147-49683 | 1203026075 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-147-49683 | 1203026076 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203026074 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203026073 | MB | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CAMO-14-53219 | 1203023596 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | CAMO-14-53219 | 1203023597 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC | CAMO-14-53219 | 341747002 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010B | INORGANIC | LCS | 1203023595 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010B | INORGANIC | MB | 1203023594 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-53219 | 341747002 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CASA-14-49694 | 1203023601 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CASA-14-49694 | 1203023602 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203023600 | LCS | 0 | 0 | 11 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:6020 | INORGANIC | MB | 1203023599 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-53219 | 341747002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-53818 | 1203026449 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-53818 | 1203026450 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203026448 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203026447 | MB | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-14-49660 | 1203026289 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-14-53218 | 341747001 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CASA-14-49691 | 1203026290 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203026293 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203026288 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203023594 | METHOD BLANK | SW-846:6010B | W | Barium | 2 | J | ug/L | 5.00 |
| MB | 1203023594 | METHOD BLANK | SW-846:6010B | W | Potassium | -67.7 | J | ug/L | 150 |
| MB | 1203023594 | METHOD BLANK | SW-846:6010B | W | Strontium | -2 | J | ug/L | 5.00 |
| MB | 1203023599 | METHOD BLANK | SW-846:6020 | W | Molybdenum | .217 | J | ug/L | 0.500 |

# DATA VALIDATION REPORT

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-53219 | 1203023594 | METHOD BLANK | SW-846:6010B | Potassium | -67.7 | ug/L | 1580 | | 150 | Y | 5 | | Y |
| CAMO-14-53219 | 1203023594 | METHOD BLANK | SW-846:6010B | Strontium | -2 | ug/L | 56.4 | | 5.00 | Y | 5 | | Y |

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

| Field Sample ID | Lab Sample ID | LD Lab Sample ID | Analytical Method | Parameter Name | Sample Matrix | Lab Result | LD Lab Result | Lab Units | Detect Flag | LD Detect Flag | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-53219 | 341747002 | 1203023764 | EPA:300.0 | Chloride | W | 2.42 | 2.41 | mg/L | Y | Y | .236 | 0 |
| CAMO-14-53219 | 341747002 | 1203023764 | EPA:300.0 | Fluoride | W | 0.297 | 0.309 | mg/L | Y | Y | 4.06 | 0 |
| CAMO-14-53219 | 341747002 | 1203023764 | EPA:300.0 | Sulfate | W | 2.85 | 2.85 | mg/L | Y | Y | .256 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Barium | W | 25.4 | 25.6 | ug/L | Y | Y | 0.439 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Calcium | W | 15700 | 15500 | ug/L | Y | Y | 1.17 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Magnesium | W | 3650 | 3530 | ug/L | Y | Y | 3.31 | 0 |

# DATA VALIDATION REPORT

| Field Sample ID | Lab Sample ID | LD Lab Sample ID | Analytical Method | Parameter Name | Sample Matrix | Lab Result | LD Lab Result | Lab Units | Detect Flag | LD Detect Flag | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Potassium | W | 1580 | 1580 | ug/L | Y | Y | 0.538 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Silicon Dioxide | W | 68500 | 67500 | ug/L | Y | Y | 1.58 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Sodium | W | 11300 | 11200 | ug/L | Y | Y | 0.541 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Strontium | W | 56.4 | 55.9 | ug/L | Y | Y | 0.892 | 0 |
| CAMO-14-53219 | 341747002 | 1203023596 | SW-846:6010B | Vanadium | W | 7.4 | 6.83 | ug/L | Y | Y | 8.01 | 0 |

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

| Reason Code | Description |
|---|---|
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAMO-14-53218 | R-34 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-53218 | R-34 | REG | EPA:335.4 | 0 | 1 |
| CAMO-14-53218 | R-34 | REG | EPA:351.2 | 0 | 1 |
| CAMO-14-53218 | R-34 | REG | SW-846:9060 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:120.1 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:150.1 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:160.1 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:300.0 | 0 | 4 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAMO-14-53219 | R-34 | REG | EPA:310.1 | 0 | 2 |
| CAMO-14-53219 | R-34 | REG | EPA:350.1 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:353.2 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | EPA:365.4 | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | SM:A2340B | 0 | 1 |
| CAMO-14-53219 | R-34 | REG | SW-846:6010B | 0 | 17 |
| CAMO-14-53219 | R-34 | REG | SW-846:6020 | 0 | 11 |
| CAMO-14-53219 | R-34 | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

February 18, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Water Samples
Work Order: 341747
SDG: 2014-2789

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on January 22, 2014, and analyzed for General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2014-2789
Enclosures

**ARS International (63641-10)**
**LANL-WQH Water Samples**
**Work Order #: 341747**
**SDG: 2014-2789**

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# Case Narrative

**Case Narrative for**
**ARS International (63641-10)**
**LANL-WQH Water Samples**
**Workorder #: 341747**
**SDG # : 2014-2789**

**February 18, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on January 22, 2014 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 341747001 | CAMO-14-53218 |
| 341747002 | CAMO-14-53219 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry, Metals and Perchlorates by LCMSMS.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 18 February 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−13−8 |
| Utah NELAP | SC000122013−11 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

341747

**COC/Lab Request #:** 2014-2789

Page 1 of 1

**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:**

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-53218 | Jan 17 2014 | 12:04 | W | 1 | | 1 | | | 1 |
| CAMO-14-53219 | Jan 17 2014 | 12:04 | W | | 1 | | 1 | 1 | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 1/21/14 3:00 | P. Nlent | Patricia Dent | 1-22-14 0905 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| **Client:** LANL | **SDG/AR/COC/Work Order:** 2014-2789 |
| **Received By:** P. Quient | **Date Received:** 1-22-14 |

| **Suspected Hazard Information** | **Yes** | **No** | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | X | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM |
| Classified Radioactive II or III by RSO? | | X | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | X | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | X | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | X | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | X | |

| | **Sample Receipt Criteria** | **Yes** | **NA** | **No** | **Comments/Qualifiers (Required for Non-Conforming Items)** |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) 3c |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | X | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | X | | | Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966 |
| 3 | Chain of custody documents included with shipment? | X | | | |
| 4 | Sample containers intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | X | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | X | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | X | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | X | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | X | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | X | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | X | | | Sample ID's affected: |
| 12 | Are sample containers identifiable as GEL provided? | | | X | clients |
| 13 | COC form is properly signed in relinquished/received sections? | X | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 5908 1776 6322-3c |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HA Date 02214 Page 1 of 1

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 21JAN14
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWKO

3c

51BC1/D6EC/6F03

FedEx Express

J131113052301 26

TRK# 0201 5908 1776 6322

WED - 22 JAN 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 08/10

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International (ARSL)**
**SDG 2014-2789**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1362962 |
| Prep Batch Number: | 1362961 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203026481 | Interference Check Sample (ICS) |
| 1203026447 | Method Blank (MB) |
| 1203026448 | Laboratory Control Sample (LCS) |
| 1203026449 | 341826001(CAMO-14-53818) Matrix Spike (MS) |
| 1203026450 | 341826001(CAMO-14-53818) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
All associated initial calibration verification standards (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 341826001 (CAMO-14-53818) from SDG 2014-2794 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
A biased high recovery for Perchlorate-101 was observed in the MS (1203026449). The recovery was 224% and the acceptance range is 75-125%. The biased high recoveries observed in the matrix spikes is due to the background concentration present in the parent sample, 341826001 (CAMO-14-53818), and the need to dilute all at a 1:20 dilution prior to analysis. The data are reported with the appropriate DER.

**Matrix Spike Duplicate (MSD) Recovery Statement**
A biased high recovery for Perchlorate-101 was observed in the MSD (1203026450). The recovery was 305% and the acceptance range is 75-125%. The biased high recoveries observed in the matrix spikes is due to the background concentration present in the parent sample, 341826001 (CAMO-14-53818), and the need to dilute all at a 1:20 dilution prior to analysis. The data are reported with the appropriate DER.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
QC samples 1203026449 (CAMO-14-53818) and 1203026450 (CAMO-14-53818) were diluted to bring the over range concentrations within the calibration range.

**Sample Re-extraction/Re-analysis**
Sample 341747002 (CAMO-14-53219) was re-analyzed to confirm potential carryover from the previous sample analysis. The re-analysis data are reported.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data Exception Report 1264672 was generated for this SDG.

A biased high recovery for Perchlorate-101 was observed in the MS (1203026449). The recovery was 224% and the acceptance range is 75-125%. The biased high recoveries observed in the matrix spikes is due to the background concentration present in the parent sample, 341826001 (CAMO-14-53818), and the need to dilute all at a 1:20 dilution prior to analysis. The data are reported with the appropriate DER.

A biased high recovery for Perchlorate-101 was observed in the MSD (1203026450). The recovery was 305% and the acceptance range is 75-125%. The biased high recoveries observed in the matrix spikes is due to the background concentration present in the parent sample, 341826001 (CAMO-14-53818), and the need to dilute all at a 1:20 dilution prior to analysis. The data are reported with the appropriate DER.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

**System Configuration**

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2789  GEL Work Order: 341747

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 11 FEB 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1362961

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-53219

**Date Received:** 22-JAN-14

**GEL Job No (SDG):** 2014-2789

**GEL Sample ID:** 341747002

**Date Filtered:** 28-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.320 | ug/L | | 1 | 28-JAN-14 15:50 | per0128032a |
| | Perchlorate Isotope Ratio | | | 2.99 | | | 1 | 28-JAN-14 15:50 | per0128032a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.330 | ug/L | | 1 | 28-JAN-14 15:50 | per0128032a |
| | Perchlorate-O(18) | | | 0.494 | ug/L | | 1 | 28-JAN-14 15:50 | per0128032a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2014-2789

**Extract Batch Code:** 1362961

**Date Filtered:** 28-JAN-14

**Matrix:** WATER

**Sample ID:** 1203026448

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .191 | ug/L | 95.6 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 2.99 | | | | - |
| Perchlorate-101 | 0.200 | .197 | ug/L | 98.4 | | 85 - 115 |
| Perchlorate-O(18) | | .496 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2014-2789

**Extract Batch Code:** 1362961

**Date Extracted:** 28-JAN-14

**GEL MS/PS ID:** 1203026449

**Client ID:** CAMO-14-53818

**GEL MSD/PSD ID:** 1203026450

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec | # | MSD Conc | MSD Rec | # | RPD | # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 14.0 | ug/L | 14.2 | 97.8 | | 14.1 | 87 | | .153 | | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.10 | | 3.04 | | | 3 | | | 1.28 | | | - |
| Perchlorate-101 | 0.200 | 13.6 | ug/L | 14.1 | 224 | * | 14.2 | 305 | * | 1.13 | | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 10.3 | ug/L | 10.3 | | | 10.5 | | | 2.28 | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1362961

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 28-JAN-14

**GEL Job No (SDG):** 2014-2789

**GEL Sample ID:** 1203026447

**Date Filtered:** 28-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 28-JAN-14 13:07 | per0128012a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 28-JAN-14 13:07 | per0128012a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 28-JAN-14 13:07 | per0128012a |
| | Perchlorate-O(18) | | | 0.469 | ug/L | | 1 | 28-JAN-14 13:07 | per0128012a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1362961

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 28-JAN-14

**GEL Job No (SDG):** 2014-2789

**GEL Sample ID:** 1203026448

**Date Filtered:** 28-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.191 | ug/L | J | 1 | 28-JAN-14 13:15 | per0128013a |
| | Perchlorate Isotope Ratio | | | 2.99 | | | 1 | 28-JAN-14 13:15 | per0128013a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.197 | ug/L | J | 1 | 28-JAN-14 13:15 | per0128013a |
| | Perchlorate-O(18) | | | 0.496 | ug/L | | 1 | 28-JAN-14 13:15 | per0128013a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1362961

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2014-2789

**GEL Sample ID:** 1203026481

**Date Filtered:** 28-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.215 | ug/L | | 1 | 28-JAN-14 13:23 | per0128014a |
| | Perchlorate Isotope Ratio | | | 3.12 | | | 1 | 28-JAN-14 13:23 | per0128014a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.212 | ug/L | | 1 | 28-JAN-14 13:23 | per0128014a |
| | Perchlorate-O(18) | | | 0.526 | ug/L | | 1 | 28-JAN-14 13:23 | per0128014a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1362961

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-53818MS

**Date Received:** 23-JAN-14

**GEL Job No (SDG):** 2014-2789

**GEL Sample ID:** 1203026449

**Date Filtered:** 28-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | 1 | 4 | 14.2 | ug/L | | 20 | 31-JAN-14 13:34 | per0131020a |
| | Perchlorate Isotope Ratio | | | 3.04 | | | 20 | 31-JAN-14 13:34 | per0131020a |
| 14797-73-0 | Perchlorate-101 | 1 | 4 | 14.1 | ug/L | | 20 | 31-JAN-14 13:34 | per0131020a |
| | Perchlorate-O(18) | | | 10.3 | ug/L | | 20 | 31-JAN-14 13:34 | per0131020a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1362961

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-53818MSD

**Date Received:** 23-JAN-14

**GEL Job No (SDG):** 2014-2789

**GEL Sample ID:** 1203026450

**Date Filtered:** 28-JAN-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | 1 | 4 | 14.1 | ug/L | | 20 | 31-JAN-14 13:42 | per0131021a |
| | Perchlorate Isotope Ratio | | | 3 | | | 20 | 31-JAN-14 13:42 | per0131021a |
| 14797-73-0 | Perchlorate-101 | 1 | 4 | 14.2 | ug/L | | 20 | 31-JAN-14 13:42 | per0131021a |
| | Perchlorate-O(18) | | | 10.5 | ug/L | | 20 | 31-JAN-14 13:42 | per0131021a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 04-FEB-14 | Federal | Others | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LC-MS/MS | SW846 6850 Modified | Liquid | ARSL001 |
| **Batch ID:** | **Sample Numbers:** | | |
| 1362962 | See below | | |

**Potentially affected work order(s)(SDG):** **341744(2014-2786),341746(2014-2788),341747(2014-2789),341823(2014-2795),341826(2014-2794),341897(2014-2798),341997(2014-2804)**

**Application Issues:**

Failed Recovery for MS/PS

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. A biased high recovery for Perchlorate-101 was observed in the MS (1203026449). The recovery was 224% and the acceptance range is 75-125%.<br><br>2. A biased high recovery for Perchlorate-101 was observed in the MSD (1203026450). The recovery was 305% and the acceptance range is 75-125%. | 1. & 2. The biased high recoveries observed in the matrix spikes is due to the background concentration present in the parent sample, 341826001 (CAMO-14-53818), and the need to dilute all at a 1:20 dilution prior to analysis. The data are reported with the appropriate DER. |

**Originator's Name:**

Charles Wilson 04-FEB-14

**Data Validator/Group Leader:**

Michael Penny 05-FEB-14

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International (ARSL)**
**SDG 2014-2789**

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 341747001 | CAMO-14-53218 |
| 341747002 | CAMO-14-53219 |
| 1203023594 | Method Blank (MB) **ICP** |
| 1203023595 | Laboratory Control Sample (LCS) |
| 1203023598 | 341747002(CAMO-14-53219L) Serial Dilution (SD) |
| 1203023596 | 341747002(CAMO-14-53219D) Sample Duplicate (DUP) |
| 1203023597 | 341747002(CAMO-14-53219S) Matrix Spike (MS) |
| 1203023599 | Method Blank (MB) **ICP-MS** |
| 1203023600 | Laboratory Control Sample (LCS) |
| 1203023603 | 341744002(CASA-14-49694L) Serial Dilution (SD) |
| 1203023601 | 341744002(CASA-14-49694D) Sample Duplicate (DUP) |
| 1203023602 | 341744002(CASA-14-49694S) Matrix Spike (MS) |
| 1203030351 | Method Blank (MB) **CVAA** |
| 1203030352 | Laboratory Control Sample (LCS) |
| 1203030355 | 341823001(CASA-14-49690L) Serial Dilution (SD) |
| 1203030353 | 341823001(CASA-14-49690D) Sample Duplicate (DUP) |
| 1203030354 | 341823001(CASA-14-49690S) Matrix Spike (MS) |

## Method/Analysis Information

| | |
|---|---|
| **Analytical Batch:** | 1361878, 1361880, 1364464 and 1367060 |
| **Prep Batch :** | 1361877, 1361879 and 1364463 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 27 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## System Configuration

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

## Calibration Information

### Instrument Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

### CRDL Requirements
The CRDL standard recoveries met the advisory control limits except for sodium in file 021214-1 at 09:33.

### ICSA/ICSAB Statement
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

### Continuing Calibration Blank (CCB) Requirements
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 341747002 (CAMO-14-53219)-ICP, 341744002 (CASA-14-49694)-ICP-MS and 341823001 (CASA-14-49690)-CVAA.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable elements met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL/MDL for CVAA, 50X the IDL/MDL for ICP, and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Dilutions are performed to minimize matrix interferences resulting from elevated mineral

element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

**Preparation Information**
The samples in this SDG were prepared exactly according to the cited SOP.

## Miscellaneous Information

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report was not required for this SDG.

**Additional Comments**
Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:** Pat Steill **Date:** 02/18/2014

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2789  GEL Work Order: 341747

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by Pat Steill 02/18/2014

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−2789 **CONTRACT:** ESHL00210 **METHOD TYPE:** EPA

**SAMPLE ID:** 341747001 **BASIS:** As Received **DATE COLLECTED** 17−JAN−14

**CLIENT ID:** CAMO−14−53218 **LEVEL:** Low **DATE RECEIVED** 22−JAN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 02/06/14 10:01 | 020614W1−4 | 1364464 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1364464 | 1364463 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 02/05/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−2789 **CONTRACT:** ESHL00210 **METHOD TYPE:** EPA

**SAMPLE ID:** 341747002 **BASIS:** As Received **DATE COLLECTED** 17−JAN−14

**CLIENT ID:** CAMO−14−53219 **LEVEL:** Low **DATE RECEIVED** 22−JAN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 02/06/14 10:02 | 020614W1−4 | 1364464 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−2789 **CONTRACT:** ESHL00210 **METHOD TYPE:** SW846

**SAMPLE ID:** 341747002 **BASIS:** As Received **DATE COLLECTED** 17−JAN−14

**CLIENT ID:** CAMO−14−53219 **LEVEL:** Low **DATE RECEIVED** 22−JAN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7440−38−2 | Arsenic | 5 | ug/L | U | 1.7 | 5 | 5 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7440−39−3 | Barium | 25.4 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−42−8 | Boron | 16.8 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7440−70−2 | Calcium | 15700 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−47−3 | Chromium | 4.14 | ug/L | J | 2 | 10 | 10 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7439−95−4 | Magnesium | 3650 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7439−98−7 | Molybdenum | 1.16 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 02/13/14 19:06 | 140213−3 | 1361880 |
| 7440−02−0 | Nickel | 0.716 | ug/L | J | 0.5 | 2 | 2 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7440−09−7 | Potassium | 1580 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7631−86−9 | Silica | 68500 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7440−23−5 | Sodium | 11300 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−24−6 | Strontium | 56.4 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7440−31−5 | Tin | 10 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−61−1 | Uranium | 0.485 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 02/12/14 20:05 | 140212−2 | 1361880 |
| 7440−62−2 | Vanadium | 7.4 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |
| 7440−66−6 | Zinc | 5.26 | ug/L | J | 3.3 | 10 | 10 | 1 | P | HSC | 02/12/14 11:52 | 021214A−1 | 1361878 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−2789 **CONTRACT:** ESHL00210 **METHOD TYPE:**

**SAMPLE ID:** 341747002 **BASIS:** As Received **DATE COLLECTED** 17−JAN−14

**CLIENT ID:** CAMO−14−53219 **LEVEL:** Low **DATE RECEIVED** 22−JAN−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 54.2 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 02/17/14 16:46 | | 1367060 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1361878 | 1361877 | SW846 3005A | 50 | mL | 50 | mL | 02/10/14 | AXG2 |
| 1361880 | 1361879 | SW846 3005A | 50 | mL | 50 | mL | 02/10/14 | AXG2 |
| 1364464 | 1364463 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 02/05/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **MS** | **SW846 3005/6020 DOE−AL** |
| **P** | **SW846 3005/6010B** |
| **AV** | **EPA 245.1/245.2** |

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2014−2789

**Contract:** ESHL00210

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203023594 | | | | | | | | |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Barium | 2 | ug/L | +/−5 | J | P | 1 | 5 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | −67.7 | ug/L | +/−150 | J | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 100 | ug/L | +/−300 | U | P | 100 | 300 |
| | Strontium | −2 | ug/L | +/−5 | J | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| 1203023599 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.217 | ug/L | +/−0.5 | J | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203030351 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **MS** | **SW846 3005/6020 DOE−AL** |
| **P** | **SW846 3005/6010B** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2789 **Client ID** CAMO−14−53219S

**Contract:** ESHL00210 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 341747002 **Spike ID:** 1203023597

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 5190 | | 68 | U | 5000 | 104 | | P |
| Barium | ug/L | 75−125 | 535 | | 25.4 | | 500 | 102 | | P |
| Beryllium | ug/L | 75−125 | 518 | | 1 | U | 500 | 104 | | P |
| Boron | ug/L | 75−125 | 512 | | 16.8 | J | 500 | 99.1 | | P |
| Calcium | ug/L | 75−125 | 21100 | | 15700 | | 5000 | 107 | | P |
| Cobalt | ug/L | 75−125 | 513 | | 1 | U | 500 | 103 | | P |
| Copper | ug/L | 75−125 | 529 | | 3 | U | 500 | 106 | | P |
| Iron | ug/L | 75−125 | 5070 | | 30 | U | 5000 | 101 | | P |
| Magnesium | ug/L | 75−125 | 8830 | | 3650 | | 5000 | 104 | | P |
| Manganese | ug/L | 75−125 | 501 | | 2 | U | 500 | 100 | | P |
| Potassium | ug/L | 75−125 | 6710 | | 1580 | | 5000 | 103 | | P |
| Silica | ug/L | | 80700 | | 68500 | | 10700 | 114 | N/A | P |
| Sodium | ug/L | 75−125 | 17000 | | 11300 | | 5000 | 114 | | P |
| Strontium | ug/L | 75−125 | 576 | | 56.4 | | 500 | 104 | | P |
| Tin | ug/L | 75−125 | 507 | | 2.5 | U | 500 | 101 | | P |
| Vanadium | ug/L | 75−125 | 524 | | 7.4 | | 500 | 103 | | P |
| Zinc | ug/L | 75−125 | 489 | | 5.26 | J | 500 | 96.7 | | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2789 **Client ID** CASA−14−49694S

**Contract:** ESHL00210 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 341744002 **Spike ID:** 1203023602

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Silver | ug/L | 75−125 | 53.7 | | 0.2 | U | 50 | 107 | | MS |
| Thallium | ug/L | 75−125 | 48.8 | | 0.45 | U | 50 | 97.6 | | MS |
| Uranium | ug/L | 75−125 | 52.1 | | 0.653 | | 50 | 103 | | MS |
| Antimony | ug/L | 75−125 | 54.6 | | 1 | U | 50 | 109 | | MS |
| Arsenic | ug/L | 75−125 | 52.6 | | 2.31 | J | 50 | 101 | | MS |
| Cadmium | ug/L | 75−125 | 52.7 | | 0.11 | U | 50 | 105 | | MS |
| Chromium | ug/L | 75−125 | 56.3 | | 4.2 | J | 50 | 104 | | MS |
| Lead | ug/L | 75−125 | 51.8 | | 0.5 | U | 50 | 104 | | MS |
| Molybdenum | ug/L | 75−125 | 53.4 | | 1.08 | | 50 | 105 | | MS |
| Nickel | ug/L | 75−125 | 57 | | 4.27 | | 50 | 106 | | MS |
| Selenium | ug/L | 75−125 | 52.1 | | 1.5 | U | 50 | 103 | | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−2789 **Client ID** CASA−14−49690S

**Contract:** ESHL00210 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 341823001 **Spike ID:** 1203030354

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 2.06 | | 0.067 | U | 2 | 103 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2789 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** CAMO−14−53219D

**Matrix:** WATER **Level:** Low

**Sample ID:** 341747002 **Duplicate ID:** 1203023596 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−20% | 25.4 | | 25.6 | | .439 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | +/−50 | 16.8 | J | 16.2 | J | 3.58 | | P |
| Calcium | ug/L | +/−20% | 15700 | | 15500 | | 1.17 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−20% | 3650 | | 3530 | | 3.31 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 1580 | | 1580 | | .538 | | P |
| Silica | ug/L | +/−20% | 68500 | | 67500 | | 1.58 | | P |
| Sodium | ug/L | +/−20% | 11300 | | 11200 | | .541 | | P |
| Strontium | ug/L | +/−20% | 56.4 | | 55.9 | | .892 | | P |
| Tin | ug/L | | 2.5 | U | 2.5 | U | | | P |
| Vanadium | ug/L | +/−5 | 7.4 | | 6.83 | | 8.01 | | P |
| Zinc | ug/L | +/−10 | 5.26 | J | 4.36 | J | 18.6 | | P |

***Analytical Methods:**

**P SW846 3005/6010B**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2789 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** CASA−14−49694D

**Matrix:** WATER **Level:** Low

**Sample ID:** 341744002 **Duplicate ID:** 1203023601 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | +/−5 | 2.31 | J | 2.85 | J | 21 | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | +/−10 | 4.2 | J | 4.21 | J | .285 | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 1.08 | | 1.09 | | .552 | | MS |
| Nickel | ug/L | +/−2 | 4.27 | | 4.27 | | .0468 | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−.2 | 0.653 | | 0.606 | | 7.47 | | MS |

***Analytical Methods:**

**MS SW846 3005/6020 DOE−AL**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−2789 **Lab Code:** GEL

**Contract:** ESHL00210 **Client ID:** CASA−14−49690D

**Matrix:** WATER **Level:** Low

**Sample ID:** 341823001 **Duplicate ID:** 1203030353 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2789

**Contract:** ESHL00210

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203023595 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 5060 | | 101 | 80−120 | P |
| | Barium | ug/L | 500 | 499 | | 99.8 | 80−120 | P |
| | Beryllium | ug/L | 500 | 497 | | 99.4 | 80−120 | P |
| | Boron | ug/L | 500 | 479 | | 95.8 | 80−120 | P |
| | Calcium | ug/L | 5000 | 5010 | | 100 | 80−120 | P |
| | Cobalt | ug/L | 500 | 501 | | 100 | 80−120 | P |
| | Copper | ug/L | 500 | 506 | | 101 | 80−120 | P |
| | Iron | ug/L | 5000 | 5020 | | 100 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 5170 | | 103 | 80−120 | P |
| | Manganese | ug/L | 500 | 498 | | 99.7 | 80−120 | P |
| | Potassium | ug/L | 5000 | 4960 | | 99.3 | 80−120 | P |
| | Silica | ug/L | 10700 | 10300 | | 96.3 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5100 | | 102 | 80−120 | P |
| | Strontium | ug/L | 500 | 508 | | 102 | 80−120 | P |
| | Tin | ug/L | 500 | 501 | | 100 | 80−120 | P |
| | Vanadium | ug/L | 500 | 502 | | 100 | 80−120 | P |
| | Zinc | ug/L | 500 | 475 | | 95 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2789

**Contract:** ESHL00210

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203023600 | | | | | | | | |
| | Antimony | ug/L | 50 | 52.8 | | 106 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 47.1 | | 94.2 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 51.9 | | 104 | 80−120 | MS |
| | Chromium | ug/L | 50 | 52 | | 104 | 80−120 | MS |
| | Lead | ug/L | 50 | 51.3 | | 103 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 55.5 | | 111 | 80−120 | MS |
| | Nickel | ug/L | 50 | 54 | | 108 | 80−120 | MS |
| | Selenium | ug/L | 50 | 48.6 | | 97.1 | 80−120 | MS |
| | Silver | ug/L | 50 | 53.4 | | 107 | 80−120 | MS |
| | Thallium | ug/L | 50 | 47.6 | | 95.3 | 80−120 | MS |
| | Uranium | ug/L | 50 | 52.4 | | 105 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−2789

**Contract:** ESHL00210

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203030352 | | | | | | | | |
| | Mercury | ug/L | 2 | 2.05 | | 102 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2789 **Client ID** CAMO−14−53219L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 341747002 **Serial Dilution ID:** 1203023598

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 25.4 | | 25.7 | | .892 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 16.8 | J | 75 | U | 100 | | | P |
| Calcium | 15700 | | 15300 | | 2.67 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 3650 | | 3550 | | 2.54 | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 1580 | | 1560 | | 1.64 | | | P |
| Silica | 68500 | | 67300 | | 1.87 | | 10 | P |
| Sodium | 11300 | | 11900 | | 5.35 | | 10 | P |
| Strontium | 56.4 | | 57.6 | | 2.13 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 7.4 | | 5 | U | 100 | | | P |
| Zinc | 5.26 | J | 16.5 | U | 100 | | | P |

***Analytical Methods:**

**P** **SW846 3005/6010B**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2789 **Client ID** CASA−14−49694L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 341744002 **Serial Dilution ID:** 1203023603

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 2.31 | J | 8.5 | U | 100 | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 4.2 | J | 10 | U | 100 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | 1.08 | | 1.13 | J | 3.88 | | | MS |
| Nickel | 4.27 | | 4.59 | J | 7.38 | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | .653 | | .625 | J | 4.29 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005/6020 DOE−AL**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−2789 **Client ID** CASA−14−49690L

**Contract:** ESHL00210

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 341823001 **Serial Dilution ID:** 1203030355

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International (ARSL)**
**SDG 2014-2789**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1362902 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 341747001 | CAMO-14-53218 |
| 1203026288 | Method Blank (MB) |
| 1203026289 | 341442001(CAMO-14-49660) Sample Duplicate (DUP) |
| 1203026290 | 341823006(CASA-14-49691) Sample Duplicate (DUP) |
| 1203026291 | 341442001(CAMO-14-49660) Post Spike (PS) |
| 1203026292 | 341823006(CASA-14-49691) Post Spike (PS) |
| 1203026293 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 341442001 (CAMO-14-49660) and 341823006 (CASA-14-49691).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1364190 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203029712 | 341540004(CAMO-14-49662) Sample Duplicate (DUP) |
| 1203029713 | 341744002(CASA-14-49694) Sample Duplicate (DUP) |
| 1203029714 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Conductivity analysis was performed on a Orion 160 Conductivity Meter.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 341540004 (CAMO-14-49662) and 341744002 (CASA-14-49694).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1364179 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203029690 | 341541002(CASA-14-49695) Sample Duplicate (DUP) |
| 1203029691 | 341540004(CAMO-14-49662) Sample Duplicate (DUP) |
| 1203029692 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Electrode analysis was performed on a PerpHect pH Meter Orion 370. BOD lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 341540004 (CAMO-14-49662) and 341541002 (CASA-14-49695).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
The following sample from this sample group was received by the lab outside of the method specified holding time: 341747002 (CAMO-14-53219).

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1264561 341747002 (CAMO-14-53219).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1362344 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1362343 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 341747001 | CAMO-14-53218 |
| 1203024841 | Method Blank (MB) |
| 1203024842 | 341744001(CASA-14-49688) Sample Duplicate (DUP) |
| 1203024844 | 341744001(CASA-14-49688) Matrix Spike (MS) |
| 1203024846 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 341744001 (CASA-14-49688).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203024842 (CASA-14-49688).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203024842 (CASA-14-49688), 1203024844 (CASA-14-49688) and 341747001 (CAMO-14-53218).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1361948 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203023763 | Method Blank (MB) |
| 1203023764 | 341747002(CAMO-14-53219) Sample Duplicate (DUP) |
| 1203023765 | 341747002(CAMO-14-53219) Post Spike (PS) |
| 1203023766 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 22.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 341747002 (CAMO-14-53219).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203023764 (CAMO-14-53219), 1203023765 (CAMO-14-53219) and 341747002 (CAMO-14-53219).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1361777 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1361776 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203023327 | Method Blank (MB) |
| 1203023328 | 341541002(CASA-14-49695) Sample Duplicate (DUP) |
| 1203023330 | 341541002(CASA-14-49695) Matrix Spike (MS) |
| 1203023332 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 341541002 (CASA-14-49695).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203023328 (CASA-14-49695).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1362820 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1362819 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 341747001 | CAMO-14-53218 |
| 1203026085 | Method Blank (MB) |
| 1203026086 | Laboratory Control Sample (LCS) |
| 1203026087 | 341997001(CAMO-147-49672) Sample Duplicate (DUP) |
| 1203026088 | 341997001(CAMO-147-49672) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 341997001 (CAMO-147-49672).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203026087 (CAMO-147-49672).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1361186 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203021934 | Method Blank (MB) |
| 1203021935 | 340998001(WST00-14-53823) Sample Duplicate (DUP) |
| 1203021937 | 340998001(WST00-14-53823) Post Spike (PS) |
| 1203021939 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 340998001 (WST00-14-53823).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203021937 (WST00-14-53823).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1262778 1203021937 (WST00-14-53823).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1362816 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1362815 | **Method:** | EEPA 365.4 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203026073 | Method Blank (MB) |
| 1203026074 | Laboratory Control Sample (LCS) |
| 1203026075 | 341997002(CAMO-147-49683) Sample Duplicate (DUP) |
| 1203026076 | 341997002(CAMO-147-49683) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 341997002 (CAMO-147-49683).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported. 341747002 (CAMO-14-53219). The following sample was re-analyzed due to (its) proximity to an overrange sample. The results form the reanalysis are reported. 1203026073 (MB).

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1362084 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203024140 | Method Blank (MB) |
| 1203024141 | 341744002(CASA-14-49694) Sample Duplicate (DUP) |
| 1203024144 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 341744002 (CASA-14-49694).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1363236 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 341747002 | CAMO-14-53219 |
| 1203027143 | Method Blank (MB) |
| 1203027144 | Laboratory Control Sample (LCS) |
| 1203027149 | 341744002(CASA-14-49694) Sample Duplicate (DUP) |
| 1203027150 | 341744002(CASA-14-49694) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 341744002 (CASA-14-49694).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____18Feb14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL001 ARS International (63641-10)

Client SDG: 2014-2789  GEL Work Order: 341747

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

H  Analytical holding time was exceeded

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: February 13, 2014

| | |
|---|---|
| Company : | Los Alamos National Laboratory |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 |
| | Los Alamos, New Mexico 87545 |
| Contact: | Mr. Keith Greene |
| Project: | LANL-WQH Water Samples |

Client SDG: 2014-2789

| | | | |
|---|---|---|---|
| Client Sample ID: | CAMO-14-53218 | Project: | ESHL00210 |
| Sample ID: | 341747001 | Client ID: | ARSL001 |
| Matrix: | W | | |
| Collect Date: | 17-JAN-14 12:04 | | |
| Receive Date: | 22-JAN-14 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | U | ND | 0.330 | 1.00 | mg/L | 1 | TSM | 01/30/14 | 2030 | 1362902 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 01/24/14 | 1251 | 1362344 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1 | KLP1 | 01/31/14 | 0937 | 1362820 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 01/24/14 | 0938 | 1362343 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 01/30/14 | 1700 | 1362819 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: February 13, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2014-2789

Client Sample ID: CAMO-14-53219
Sample ID: 341747002
Matrix: W
Collect Date: 17-JAN-14 12:04
Receive Date: 22-JAN-14
Collector: Client

Project: ESHL00210
Client ID: ARSL001

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conductivity Analysis | | | | | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 155 | 1.00 | 1.00 | umhos/cm | 1 | TXT1 | 02/04/14 | 1537 | 1364190 | 1 |
| Electrode Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 14.2C | H | 7.98 | 0.010 | 0.100 | SU | 1 | LYG1 | 02/04/14 | 1043 | 1364179 | 2 |
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | 1 | DM | 01/24/14 | 2342 | 1361948 | 3 |
| Chloride | | 2.42 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.297 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 2.85 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | J | 0.0185 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 01/23/14 | 1454 | 1361777 | 4 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.447 | 0.017 | 0.050 | mg/L | 1 | AXH3 | 01/27/14 | 1136 | 1361186 | 5 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | J | 0.0199 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 01/31/14 | 1241 | 1362816 | 6 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 129 | 3.40 | 14.3 | mg/L | | LYG1 | 01/23/14 | 0957 | 1362084 | 7 |
| Titration Analysis | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 67.8 | 0.725 | 1.00 | mg/L | | LXA1 | 01/30/14 | 1715 | 1363236 | 8 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 01/23/14 | 1415 | 1361776 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 01/30/14 | 1700 | 1362815 |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: February 13, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2014-2789 |
| Project: | LANL-WQH Water Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAMO-14-53219 | Project: | ESHL00210 |
| Sample ID: | 341747002 | Client ID: | ARSL001 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 120.1 | |
| 2 | EPA 150.1 | |
| 3 | EPA 300.0 | |
| 4 | EPA 350.1 | |
| 5 | EPA 353.2 | |
| 6 | EPA 365.4 | |
| 7 | EPA 160.1 | |
| 8 | EPA 310.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

**Report Date: February 13, 2014**



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **341747**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | |
| Batch 1362902 | | | | | | | | | | | |
| QC1203026289 341442001 DUP | | | | | | | | | | | |
| Total Organic Carbon Average | | U | ND | U | ND | mg/L | N/A | | | TSM | 01/30/14 16:22 |
| QC1203026290 341823006 DUP | | | | | | | | | | | |
| Total Organic Carbon Average | | U | ND | U | ND | mg/L | N/A | | | | 01/30/14 22:45 |
| QC1203026293 LCS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 9.67 | mg/L | | 96.7 | (85%-115%) | | 01/30/14 15:40 |
| QC1203026288 MB | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | 01/30/14 15:31 |
| QC1203026291 341442001 PS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | U | ND | | 10.1 | mg/L | | 99.6 | (65%-120%) | | 01/30/14 16:42 |
| QC1203026292 341823006 PS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | U | ND | | 10.6 | mg/L | | 104 | (65%-120%) | | 01/30/14 23:04 |
| **Conductivity Analysis** | | | | | | | | | | | |
| Batch 1364190 | | | | | | | | | | | |
| QC1203029712 341540004 DUP | | | | | | | | | | | |
| Conductivity | | | 192 | | 192 | umhos/cm | 0.052 | | (0%-10%) | TXT1 | 02/04/14 15:30 |
| QC1203029713 341744002 DUP | | | | | | | | | | | |
| Conductivity | | | 239 | | 243 | umhos/cm | 1.66 | | (0%-10%) | | 02/04/14 15:34 |
| QC1203029714 LCS | | | | | | | | | | | |
| Conductivity | 1410 | | | | 1410 | umhos/cm | | 99.9 | (95%-105%) | | 02/04/14 15:17 |
| **Electrode Analysis** | | | | | | | | | | | |
| Batch 1364179 | | | | | | | | | | | |
| QC1203029690 341541002 DUP | | | | | | | | | | | |
| pH | | H | 7.84 | H | 7.88 | SU | 0.509 | | (0%-10%) | LYG1 | 02/04/14 10:27 |
| QC1203029691 341540004 DUP | | | | | | | | | | | |
| pH | | H | 7.84 | H | 7.88 | SU | 0.509 | | (0%-10%) | | 02/04/14 10:23 |
| QC1203029692 LCS | | | | | | | | | | | |
| pH | 7.00 | | | | 7.03 | SU | | 100 | (99%-101%) | | 02/04/14 10:03 |
| **Flow Injection Analysis** | | | | | | | | | | | |
| Batch 1362344 | | | | | | | | | | | |
| QC1203024842 341744001 DUP | | | | | | | | | | | |

## QC Summary

**Workorder:** **341747**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Flow Injection Analysis** | | | | | | | | | | | |
| Batch 1362344 | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | AXH3 | 01/24/14 12:48 |
| QC1203024846 LCS | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 46.4 | ug/L | | 92.8 | (90%-110%) | | 01/24/14 12:20 |
| QC1203024841 MB | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | 01/24/14 12:20 |
| QC1203024844 341744001 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 97.2 | ug/L | | 97.2 | (90%-110%) | | 01/24/14 12:49 |
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1361948 | | | | | | | | | | | |
| QC1203023764 341747002 DUP | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | DM | 01/25/14 00:13 |
| Chloride | | | 2.42 | | 2.41 | mg/L | 0.236 | | (0%-20%) | | |
| Fluoride | | | 0.297 | | 0.309 | mg/L | 4.06 ^ | | (+/-0.100) | | |
| Sulfate | | | 2.85 | | 2.85 | mg/L | 0.256 | | (0%-20%) | | |
| QC1203023766 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.28 | mg/L | | 103 | (90%-110%) | | 01/24/14 22:08 |
| Chloride | 5.00 | | | | 4.72 | mg/L | | 94.5 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.43 | mg/L | | 97.4 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 9.80 | mg/L | | 98 | (90%-110%) | | |
| QC1203023763 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 01/24/14 21:36 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203023765 341747002 PS | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.31 | mg/L | | 105 | (90%-110%) | | 01/25/14 00:45 |
| Chloride | 5.00 | | 2.42 | | 7.37 | mg/L | | 99 | (90%-110%) | | |
| Fluoride | 2.50 | | 0.297 | | 2.74 | mg/L | | 97.8 | (90%-110%) | | |

## QC Summary

**Workorder:** **341747**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1361948 | | | | | | | | | | | |
| Sulfate | 10.0 | | 2.85 | | 12.9 | mg/L | | 100 | (90%-110%) | DM | 01/25/14 00:45 |
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1361186 | | | | | | | | | | | |
| QC1203021935 340998001 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | U | ND | U | ND | mg/L | N/A | | | AXH3 | 01/27/14 11:05 |
| QC1203021939 LCS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 1.03 | mg/L | | 103 | (90%-110%) | | 01/27/14 11:02 |
| QC1203021934 MB | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | | U | ND | mg/L | | | | | 01/27/14 11:00 |
| QC1203021937 340998001 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | U | ND | | 0.869 | mg/L | | 86.9* | (90%-110%) | | 01/27/14 11:06 |
| Batch 1361777 | | | | | | | | | | | |
| QC1203023328 341541002 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | J | 0.0354 | J | 0.0283 | mg/L | 22.3 ^ | | (+/-0.050) | KLP1 | 01/23/14 14:37 |
| QC1203023332 LCS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 1.03 | mg/L | | 103 | (90%-110%) | | 01/23/14 14:31 |
| QC1203023327 MB | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | U | ND | mg/L | | | | | 01/23/14 14:30 |
| QC1203023330 341541002 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | J | 0.0354 | | 1.05 | mg/L | | 101 | (90%-110%) | | 01/23/14 14:42 |
| Batch 1362816 | | | | | | | | | | | |
| QC1203026075 341997002 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | | 2.70 | | 2.59 | mg/L | 4.16 | | (0%-20%) | KLP1 | 01/31/14 12:55 |
| QC1203026074 LCS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 0.970 | mg/L | | 97 | (79%-126%) | | 01/31/14 12:08 |
| QC1203026073 MB | | | | | | | | | | | |
| Phosphorus, Total as P | | | | U | ND | mg/L | | | | | 01/31/14 12:35 |
| QC1203026076 341997002 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | 2.70 | | 3.69 | mg/L | | 99 | (64%-134%) | | 01/31/14 12:55 |
| Batch 1362820 | | | | | | | | | | | |
| QC1203026087 341997001 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | J | 0.0785 | U | ND | mg/L | 200 ^ | | | KLP1 | 01/31/14 09:58 |

## QC Summary

**Workorder:** **341747**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1362820 | | | | | | | | | | | |
| QC1203026086 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 1.10 | mg/L | | 110 | (90%-110%) | KLP1 | 01/31/14 09:35 |
| QC1203026085 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | U | ND | mg/L | | | | | 01/31/14 09:34 |
| QC1203026088 341997001 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | J | 0.0785 | | 1.09 | mg/L | | 101 | (90%-110%) | | 01/31/14 09:59 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1362084 | | | | | | | | | | | |
| QC1203024141 341744002 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 173 | | 166 | mg/L | 4.22 | | (0%-10%) | LYG1 | 01/23/14 09:57 |
| QC1203024144 LCS | | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | | 291 | mg/L | | 97.1 | (95%-105%) | | 01/23/14 09:57 |
| QC1203024140 MB | | | | | | | | | | | |
| Total Dissolved Solids | | | | U | ND | mg/L | | | | | 01/23/14 09:57 |
| **Titration Analysis** | | | | | | | | | | | |
| Batch 1363236 | | | | | | | | | | | |
| QC1203027149 341744002 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | 103 | | 103 | mg/L | 0.00 | | (0%-20%) | LXA1 | 01/30/14 17:01 |
| Carbonate alkalinity (CaCO3) | | U | ND | U | ND | mg/L | N/A | | | | |
| QC1203027144 LCS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | | 50.4 | mg/L | | 101 | (90%-110%) | | 01/30/14 16:30 |
| QC1203027143 MB | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | | U | ND | mg/L | | | | | 01/30/14 16:25 |
| Carbonate alkalinity (CaCO3) | | | | U | ND | mg/L | | | | | |
| QC1203027150 341744002 MS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | 103 | | 153 | mg/L | | 99.8 | (80%-120%) | | 01/30/14 17:03 |

**Notes:**

< Result is less than value reported

> Result is greater than value reported

B The target analyte was detected in the associated blank.

## QC Summary

**Workorder:** **341747**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 27-JAN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 353.2 | Liquid | ESHL, NEVA, PTQA, UCOR |
| **Batch ID:** | **Sample Numbers:** | | |
| 1361186 | See Below | | |

**Potentially affected work order(s)(SDG):** **340967(WS-210),340998(2014-2744),341175(2014-2756),341231(2014-2761),341321(2014-2765),341442(2014-2768),341444(V3924),341540(2014-2784),341541(2014-2783),341557,341744(2014-2786),341746(2014-2788),341747(2014-2789),341823(2014-2795)**

**Application Issues:**

Failed Recovery for MS/PS

Container scanning event for custody missed

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203021937PS,1203021938PS<br><br>2. Container scanning event for custody missed:<br><br>340967 001 | 1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.<br>The spike recovery falls outside of the established acceptance limits due to matrix interference.<br><br>2. Sample was inadvertently not scanned; however, the sample was in the analyst's custody at the time of analysis. |

**Originator's Name:**

Aubrey Kingsbury 27-JAN-14

**Data Validator/Group Leader:**

Thomas Lewis 27-JAN-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 04-FEB-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ELECTRODE | EPA 150.1 | Liquid | BETT, ESHL, GELC |
| **Batch ID:** | **Sample Numbers:** | | |
| 1364179 | See Below | | |

**Potentially affected work order(s)(SDG):** **341404,341540(2014-2784),341541(2014-2783),341744(2014-2786),341746(2014-2788),341747(2014-2789),341748,341823(2014-2795),341897(2014-2798),341997(2014-2804),342299(2014-2818)**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Sample received out of holding:<br>341404 002,005,008<br>341540 002,004,006<br>341541 002<br>341744 002<br>341746 002<br>341747 002<br>341748 001,002<br>341823 002,004,005<br>341897 002<br>341997 002<br>342299 001 | 1. Sample received out of holding. |

**Originator's Name:**
Lindsey Jensen 04-FEB-14

**Data Validator/Group Leader:**
Elzbieta Szulc 04-FEB-14

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2014-3375



**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-75544 | May 9 2014 | 12:41 | W | 1 | | | | 1 | | | 1 |
| CAMO-14-75548 | May 9 2014 | 12:41 | W | | | | 1 | | 1 | 1 | |
| CAMO-14-75545 | May 9 2014 | 11:20 | W | 1 | 2 | 3 | | 1 | | | 1 |
| CAMO-14-75549 | May 9 2014 | 11:20 | W | | | | 1 | | 1 | 1 | |
| CAMO-14-75541 | May 9 2014 | 11:20 | W | | 2 | | | | | | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martyn | 5/12/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4642

**EVENT NAME:** Mortandad/Sandia (MDA C and GS Investigation) MY2014 Q3 Watershed Sampling

**SAMPLE ID:** CAMO-14-75541

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 05/09/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1120 | MEDIA: | UA | ✓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | R-46 | ✓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ✓ | FIELD QC TYPE: | FTB | ✓ |
| PORT: | SINGLE COMPLETION | ✓ | SAMPLE USAGE: | QC | ✓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | MS |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:** AS 5/9/14

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)**

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** 5/9/14 11:01:10 | **RECEIVED BY (Printed Name) (Signature)** K. Greene | **Date/Time** 5/9/14 12:10 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** 5/9/14 | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 05/01/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4642

**EVENT NAME:** Mortandad/Sandia (MDA C and GS Investigation) MY2014 Q3 Watershed Sampling

**SAMPLE ID:** CAMO-14-75544

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 05/09/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1241 | MEDIA: | UA | ↓ |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | GSP |
| LOCATION ID: | R-34 | ↓ | FIELD PREP: | UF | OK |
| LOCATION TYPE: | MON | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | SINGLE COMPLETION | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:** Sampled within 50' of running diesel generator

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen 6.11 mg/L  Flow (in gpm) 2.86 GPM  Oxidation-Reduction Potential -17.8 mV

pH 8.31 SU  Specific Conductance 155 uS/cm  Temperature 22.22 deg C

Turbidity 1.4 NTU

**COLLECTED BY (PRINT)** J. Romero

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Julie Mape<br>(Signature) | 05/09/2014 1335 | (Printed Name) K. Green<br>(Signature) | 05/09/2014 1335 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 05/01/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4642

**EVENT NAME:** Mortandad/Sandia (MDA C and GS Investigation) MY2014 Q3 Watershed Sampling

**SAMPLE ID:** CAMO-14-75545

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 05/09/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1120 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | BSP |
| LOCATION ID: | R-46 | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | MON | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | SINGLE COMPLETION | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 2 | ICE JR 5/9/14 | ↓ | ↓ |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | ↓ | ↓ |
| ↓ | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:** diesel generator running 40' downwind

**FIELD PARAMETERS:**

Dissolved Oxygen 6.49 mg/L  Flow (in gpm) 4.69 GPM  Oxidation-Reduction Potential 46.6 mV

pH 7.83 SU  Specific Conductance 126 uS/cm  Temperature 21.08 deg C

Turbidity 0.65 NTU

**COLLECTED BY (PRINT)** J. Vigil

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Jordan | 5/9/14 1210 | K. Greene | 5/9/14 1210 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date 05/01/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4642

**EVENT NAME:** Mortandad/Sandia (MDA C and GS Investigation) MY2014 Q3 Watershed Sampling

**SAMPLE ID:** CAMO-14-75548

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 05/09/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1241 | MEDIA: | UA | ↓ |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | GSP |
| LOCATION ID: | R-34 | ↓ | FIELD PREP: | F | OK |
| LOCATION TYPE: | MON | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | SINGLE COMPLETION | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | NA |
| ↓ | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:** NA

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen NA mg/L  Flow (in gpm) NA GPM  Oxidation-Reduction Potential NA mV

pH NA SU  Specific Conductance NA uS/cm  Temperature NA deg C

Turbidity NA NTU

**COLLECTED BY (PRINT)** J. Maze

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Julie Maze<br>(Signature) | 05/09/2014 1335 | (Printed Name) K. Vicente<br>(Signature) | 05/09/2014 1335 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 05/01/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 4642

**EVENT NAME:** Mortandad/Sandia (MDA C and GS Investigation) MY2014 Q3 Watershed Sampling

**SAMPLE ID:** CAMO-14-75549

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 05/09/2014 | **FIELD MATRIX:** | WG | |
| **TIME COLLECTED (HH:MM):** | | 1120 | **MEDIA:** | UA | |
| **PRS ID:** | | ok | **SAMPLE TECH CODE:** | UA | GSI |
| **LOCATION ID:** | R-46 | | **FIELD PREP:** | F | ok |
| **LOCATION TYPE:** | MON | | **FIELD QC TYPE:** | REG | |
| **PORT:** | SINGLE COMPLETION | | **SAMPLE USAGE:** | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | NA |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AJ 5/9/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Utgt

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** Andrea Stokes | **Date/Time** 5/9/14 1210 | **RECEIVED BY (Printed Name) (Signature)** K. Greene | **Date/Time** 5/9/14 12:10 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 05/01/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-3375

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 350826 | SW-846:6010C | 1 | | | | |
| 350826 | SW-846:6020 | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 350826 | SW-846:6010C | 1396634 | 1396633 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 350826 | SW-846:6020 | 1396636 | 1396635 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:6010C | INORGANIC | CAMO-14-75549 | 1203110994 | DUP | 16 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-14-75549 | 1203110995 | MS | 0 | 0 | 16 | 0 |
| SW-846:6010C | INORGANIC | CAMO-14-75549 | 350826001 | REG | 16 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203110993 | LCS | 0 | 0 | 16 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203110992 | MB | 16 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-75549 | 1203110999 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-75549 | 1203111000 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-75549 | 350826001 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203110998 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203110997 | MB | 11 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

# DATA VALIDATION REPORT

No.

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

# DATA VALIDATION REPORT

13. Display Flagged Data.

None.

| Reason Code | Description |
|---|---|
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAMO-14-75549 | R-46 | REG | SW-846:6010C | 0 | 16 |
| CAMO-14-75549 | R-46 | REG | SW-846:6020 | 0 | 11 |

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-3375

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 348530 | EPA:120.1 | 2 | | | | |
| 348530 | EPA:150.1 | 2 | | | | |
| 348530 | EPA:160.1 | 2 | | | | |
| 348530 | EPA:245.2 | 4 | | | | |
| 348530 | EPA:300.0 | 2 | | | | |
| 348530 | EPA:310.1 | 2 | | | | |
| 348530 | EPA:335.4 | 2 | | | | |
| 348530 | EPA:350.1 | 2 | | | | |
| 348530 | EPA:351.2 | 2 | | | | |
| 348530 | EPA:353.2 | 2 | | | | |
| 348530 | EPA:365.4 | 2 | | | | |
| 348530 | SM:A2340B | 2 | | | | |
| 348530 | SW-846:6010C | 2 | | | | |
| 348530 | SW-846:6020 | 2 | | | | |
| 348530 | SW-846:6850 | 2 | | | | |
| 348530 | SW-846:8260B | 1 | | 1 | | |
| 348530 | SW-846:8270D | 1 | | | | |
| 348530 | SW-846:9060 | 2 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 348530 | EPA:120.1 | 1391989 | 1391989 | 2 | | | | | | | | | | 1 | | | | 1 | | | |
| 348530 | EPA:150.1 | 1390573 | 1390573 | 2 | | | | | | | | | | 1 | | | | 1 | | | |
| 348530 | EPA:160.1 | 1387730 | 1387730 | 2 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 348530 | EPA:245.2 | 1391688 | 1391687 | 4 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 348530 | EPA:300.0 | 1387241 | 1387241 | 2 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 348530 | EPA:310.1 | 1390102 | 1390102 | 2 | | | | | 2 | 1 | | | | 2 | | | | 1 | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 348530 | EPA:335.4 | 1387858 | 1387857 | 2 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 348530 | EPA:350.1 | 1387647 | 1387646 | 2 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 348530 | EPA:351.2 | 1387649 | 1387648 | 2 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 348530 | EPA:353.2 | 1387667 | 1387667 | 2 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 348530 | EPA:365.4 | 1386914 | 1386913 | 2 | | | | | 1 | 2 | | | | 1 | | | | 2 | | | |
| 348530 | SM:A2340B | 1392496 | 1392496 | 2 | | | | | | | | | | | | | | | | | |
| 348530 | SW-846:6010C | 1387760 | 1387759 | 2 | | | | | 1 | 1 | 1 | | | 1 | | | | 1 | | | |
| 348530 | SW-846:6020 | 1387803 | 1387802 | 2 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 348530 | SW-846:6850 | 1388153 | 1388152 | 2 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 348530 | SW-846:8260B | 1390101 | 1390101 | 1 | | 1 | | | 2 | | | | | 4 | | | | | | | |
| 348530 | SW-846:8270D | 1387889 | 1387888 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 348530 | SW-846:9060 | 1387445 | 1387445 | 2 | | | | | 1 | | | | | 1 | | | | 2 | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CASA-14-75532 | 1203098766 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203098768 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-14-75550 | 1203095300 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203095299 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-14-75863 | 1203087965 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203087967 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203087964 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-75544 | 348530001 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-75545 | 348530003 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:245.2 | INORGANIC | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-75863 | 1203097983 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-14-75863 | 1203097984 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203097982 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203097981 | MB | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-75548 | 348530002 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-75549 | 348530004 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-14-75550 | 1203088764 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CASA-14-75534 | 1203086677 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203086679 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203086676 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-14-75548 | 348530002 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-14-75549 | 348530004 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-14-75550 | 1203094010 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-14-75550 | 1203094011 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203094009 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203094423 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203094012 | MB | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203094422 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-14-75544 | 348530001 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-14-75545 | 348530003 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203088229 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203088224 | MB | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | WSTMO-14-75608 | 1203088225 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | WSTMO-14-75608 | 1203088227 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CASA-14-75532 | 1203087752 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CASA-14-75532 | 1203087754 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203087755 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203087750 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-75502 | 1203087758 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-75502 | 1203087760 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-75544 | 348530001 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-14-75545 | 348530003 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203087761 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203087756 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-14-75517 | 1203087805 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203087810 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203087801 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-14-75517 | 1203085715 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-14-75517 | 1203085718 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203085719 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203085712 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | NP160-14-74443 | 1203087746 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | NP160-14-74443 | 1203087747 | MS | 0 | 0 | 1 | 0 |
| SM:A2340B | INORGANIC | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-14-75548 | 348530002 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-14-75549 | 348530004 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-14-75863 | 1203088027 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-14-75863 | 1203088028 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | CAMO-14-75863 | 1203088029 | MSD | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203088026 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203088025 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-75548 | 348530002 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-75549 | 348530004 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-75863 | 1203088107 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-14-75863 | 1203088108 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203088106 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203088105 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-75548 | 348530002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-75549 | 348530004 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CASA-14-75538 | 1203088980 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CASA-14-75538 | 1203088981 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203088979 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203088978 | MB | 1 | 0 | 0 | 0 |
| SW-846:8260B | VOC | CAMO-14-75541 | 348530005 | FTB | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAMO-14-75545 | 348530003 | REG | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | LCS | 1203094005 | LCS | 0 | 3 | 70 | 0 |
| SW-846:8260B | VOC | LCS | 1203094006 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | LCS | 1203099706 | LCS | 0 | 3 | 70 | 0 |
| SW-846:8260B | VOC | LCS | 1203099707 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203094002 | MB | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | MB | 1203099705 | MB | 80 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | CAMO-14-75494 | 1203088331 | MS | 0 | 6 | 76 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8270D | SVOC | CAMO-14-75494 | 1203088332 | MSD | 0 | 6 | 76 | 0 |
| SW-846:8270D | SVOC | CAMO-14-75545 | 348530003 | REG | 80 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | LCS | 1203088330 | LCS | 0 | 6 | 76 | 0 |
| SW-846:8270D | SVOC | MB | 1203088329 | MB | 80 | 6 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-14-75544 | 348530001 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-14-75545 | 348530003 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CASA-14-75526 | 1203087254 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CASA-14-75528 | 1203087253 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203087257 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203087252 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203088025 | METHOD BLANK | SW-846:6010C | W | Potassium | 97.1 | J | ug/L | 150 |

No.

6. Any surrogate recoveries outside the control limits?

No.

# DATA VALIDATION REPORT

7. Any MS/MSD recoveries or RPDs outside the control limits?

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WSTMO-14-75608 | 1203088227 | | EPA:335.4 | Cyanide (Total) | 1387857 | 05-15-2014 | W | 84.2 | | 110 | 90 | 10 | | |

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203094005 | | SW-846:8260B | Hexachlorobutadiene | 1390101 | 05-23-2014 | W | 130 | | 128 | 71 | | 10 | | |
| 1203099706 | | SW-846:8260B | Trichlorofluoromethane | 1390101 | 05-24-2014 | W | 137 | | 123 | 73 | | 10 | | |
| 1203099706 | | SW-846:8260B | Vinyl acetate | 1390101 | 05-24-2014 | W | 131 | | 130 | 78 | | 10 | | |
| 1203099707 | | SW-846:8260B | Acrolein | 1390101 | 05-24-2014 | W | 131 | | 126 | 65 | | 10 | | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

# DATA VALIDATION REPORT

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Aluminum | U | R | I19 | N | 200 | ug/L | 200 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Antimony | U | R | I19 | N | 3.00 | ug/L | 3.00 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Arsenic | | R | I19 | Y | 5.44 | ug/L | 5.44 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Barium | | R | I19 | Y | 97.2 | ug/L | 97.2 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Beryllium | U | R | I19 | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Boron | J | R | I19 | Y | 16.3 | ug/L | 16.3 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Cadmium | U | R | I19 | N | 1.00 | ug/L | 1.00 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Calcium | | R | I19 | Y | 53600 | ug/L | 53.6 | mg/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Chromium | | R | I19 | Y | 923 | ug/L | 923 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Cobalt | U | R | I19 | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Copper | U | R | I19 | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SM:A2340B | Hardness | | R | I19 | Y | 196 | mg/L | 196 | mg/L | | | W | 05/09/2014 | | 1392496 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Iron | U | R | I19 | N | 100 | ug/L | 100 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Lead | U | R | I19 | N | 2.00 | ug/L | 2.00 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Magnesium | | R | I19 | Y | 15100 | ug/L | 15.1 | mg/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Manganese | U | R | I19 | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Molybdenum | | R | I19 | Y | .628 | ug/L | .628 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Nickel | | R | I19 | Y | 24.5 | ug/L | 24.5 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Potassium | | R | I19 | Y | 2370 | ug/L | 2.37 | mg/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Selenium | U | R | I19 | N | 5.00 | ug/L | 5.00 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Silicon Dioxide | | R | I19 | Y | 73500 | ug/L | 73.5 | mg/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Silver | U | R | I19 | N | 1.00 | ug/L | 1.00 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Sodium | | R | I19 | Y | 17400 | ug/L | 17.4 | mg/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Strontium | | R | I19 | Y | 201 | ug/L | 201 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Thallium | U | R | I19 | N | 2.00 | ug/L | 2.00 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Tin | U | R | I19 | N | 100 | ug/L | 100 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6020 | Uranium | | R | I19 | Y | 1.04 | ug/L | 1.04 | ug/L | | | W | 05/09/2014 | | 1387803 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Vanadium | J | R | I19 | Y | 4.97 | ug/L | 4.97 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |
| R-46 | 2014-3375 | CAMO-14-75549 | REG | INIT | INORGANIC | SW-846:6010C | Zinc | U | R | I19 | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 05/09/2014 | | 1387760 | VAL | Y |

| Reason Code | Description |
|---|---|
| I19 | the LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used under advisement by the LANL project chemist. |
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAMO-14-75541 | R-46 | FTB | SW-846:8260B | 0 | 80 |
| CAMO-14-75544 | R-34 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-75544 | R-34 | REG | EPA:335.4 | 0 | 1 |
| CAMO-14-75544 | R-34 | REG | EPA:351.2 | 0 | 1 |
| CAMO-14-75544 | R-34 | REG | SW-846:9060 | 0 | 1 |
| CAMO-14-75545 | R-46 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-75545 | R-46 | REG | EPA:335.4 | 0 | 1 |
| CAMO-14-75545 | R-46 | REG | EPA:351.2 | 0 | 1 |
| CAMO-14-75545 | R-46 | REG | SW-846:8260B | 0 | 80 |
| CAMO-14-75545 | R-46 | REG | SW-846:8270D | 0 | 80 |
| CAMO-14-75545 | R-46 | REG | SW-846:9060 | 0 | 1 |
| CAMO-14-75548 | R-34 | REG | EPA:120.1 | 0 | 1 |
| CAMO-14-75548 | R-34 | REG | EPA:150.1 | 0 | 1 |
| CAMO-14-75548 | R-34 | REG | EPA:160.1 | 0 | 1 |
| CAMO-14-75548 | R-34 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-75548 | R-34 | REG | EPA:300.0 | 0 | 4 |
| CAMO-14-75548 | R-34 | REG | EPA:310.1 | 0 | 2 |
| CAMO-14-75548 | R-34 | REG | EPA:350.1 | 0 | 1 |
| CAMO-14-75548 | R-34 | REG | EPA:353.2 | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAMO-14-75548 | R-34 | REG | EPA:365.4 | 0 | 1 |
| CAMO-14-75548 | R-34 | REG | SM:A2340B | 0 | 1 |
| CAMO-14-75548 | R-34 | REG | SW-846:6010C | 0 | 17 |
| CAMO-14-75548 | R-34 | REG | SW-846:6020 | 0 | 11 |
| CAMO-14-75548 | R-34 | REG | SW-846:6850 | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | EPA:120.1 | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | EPA:150.1 | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | EPA:160.1 | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | EPA:245.2 | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | EPA:300.0 | 0 | 4 |
| CAMO-14-75549 | R-46 | REG | EPA:310.1 | 0 | 2 |
| CAMO-14-75549 | R-46 | REG | EPA:350.1 | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | EPA:353.2 | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | EPA:365.4 | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | SM:A2340B | 0 | 1 |
| CAMO-14-75549 | R-46 | REG | SW-846:6010C | 0 | 17 |
| CAMO-14-75549 | R-46 | REG | SW-846:6020 | 0 | 11 |
| CAMO-14-75549 | R-46 | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

June 03, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL- WQH Water Samples
Work Order: 348530
SDG: 2014-3375

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on May 13, 2014, and analyzed for GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Chain of Custody: 2014-3375
Enclosures

**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL- WQH Water Samples**
**Work Order #: 348530**
**SDG: 2014-3375**

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# Case Narrative

**Case Narrative for**
**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL- WQH Water Samples**
**Workorder #: 348530**
**SDG # : 2014-3375**

**June 09, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on May 13, 2014 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 348530001 | CAMO-14-75544 |
| 348530002 | CAMO-14-75548 |
| 348530003 | CAMO-14-75545 |
| 348530004 | CAMO-14-75549 |
| 348530005 | CAMO-14-75541 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 03 June 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−14−9 |
| Utah NELAP | SC000122014−12 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

348530

ADEP

COC/Lab Request #: 2014-3375

Page 1 of 1

**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAMO-14-75544 | May 9 2014 | 12:41 | W | 1 | | | | 1 | | | 1 |
| CAMO-14-75548 | May 9 2014 | 12:41 | W | | | | 1 | | 1 | 1 | |
| CAMO-14-75545 | May 9 2014 | 11:20 | W | 1 | 2 | 3 | | 1 | | | 1 |
| CAMO-14-75549 | May 9 2014 | 11:20 | W | | | | 1 | | 1 | 1 | |
| CAMO-14-75541 | May 9 2014 | 11:20 | W | | 2 | | | | | | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martin | 5/12/14 3:04 | | H. Taylor | 5/13/14 09:20 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| **Client:** LANL | **SDG/AR/COC/Work Order:** 2014-3375 |
| **Received By:** H Taylor | **Date Received:** 051314 |

| **Suspected Hazard Information** | **Yes** | **No** | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | ✓ | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0cpm |
| Classified Radioactive II or III by RSO? | | ✓ | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | ✓ | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | ✓ | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | ✓ | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | ✓ | |

| | **Sample Receipt Criteria** | **Yes** | **NA** | **No** | **Comments/Qualifiers (Required for Non-Conforming Items)** |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | ✓ | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) 3,4 *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | ✓ | | | Temperature Device Serial #: 130462961 Secondary Temperature Device Serial # (If Applicable): |
| 3 | Chain of custody documents included with shipment? | ✓ | | | |
| 4 | Sample containers intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | | ✓ | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | | ✓ | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | ✓ | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | ✓ | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | ✓ | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | ✓ | | | Sample ID's affected: CAMO-14-75541 received 1 vial, chain indicates 2 CAMO-14-75545 received 2 containers, chain indicates 3 |
| 11 | Number of containers received match number indicated on COC? | | | ✓ | Sample ID's affected: |
| 12 | Are sample containers identifiable as GEL provided? | | | ✓ | |
| 13 | COC form is properly signed in relinquished/received sections? | ✓ | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 5908 1777 0380-3 0417-4 0406-3 0391-4 0370-3 |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials Hope Taylor Date 051314 Page 1 of 1

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A01407Q00

3c

518C1/62D3/6F03

FedEx Express

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2 of 2
MPS# 0263 5908 1777 0380
Mstr# 5908 1777 0370

0201

TUE - 13 MAY 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 46.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWLO

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518C1/62D3/6F03

FedEx Express

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TRK# 0201 5908 1777 0417

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PRIORITY OVERNIGHT

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29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWKO

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2 of 2

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Mstr# 5908 1777 0391 0201

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PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (50[illegible] 9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWK0

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1 of 2

TRK# 0201 5908 1777 0391

TUE - 13 MAY 10:30A
PRIORITY OVERNIGHT

## MASTER ##

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A01407Q00

518C1/62D3/6F03

FedEx Express

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1 of 2

TRK# 0201 5908 1777 0370

TUE - 13 MAY 10:30A
PRIORITY OVERNIGHT

## MASTER ##

XX CHSA

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SC-US CHS

Part # 156148-434 RIT2 10/11

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# Case Narrative

**ChemStation Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3375**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer** |
| Analytical Method: | SW846 8260B DOE-AL |
| Analytical Batch Number: | 1390101 |

## Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|---|---|
| 348530003 | CAMO-14-75545 |
| 348530005 | CAMO-14-75541 |
| 1203094002 | Method Blank (MB) |
| 1203094003 | 348269001(CAMO-14-75543) Post Spike (PS) |
| 1203094004 | 348269001(CAMO-14-75543) Post Spike Duplicate (PSD) |
| 1203094005 | Laboratory Control Sample (LCS) |
| 1203094006 | Laboratory Control Sample (LCS) |
| 1203094007 | 348269001(CAMO-14-75543) Post Spike (PS) |
| 1203094008 | 348269001(CAMO-14-75543) Post Spike Duplicate (PSD) |
| 1203099705 | Method Blank (MB) |
| 1203099706 | Laboratory Control Sample (LCS) |
| 1203099707 | Laboratory Control Sample (LCS) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a ’d’ qualifier.

## Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Blank (MB) Statement**
The blanks analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

**Laboratory Control Sample (LCS) Recovery**
The LCS 1203094005 (LCS), 1203099706 (LCS) and 1203099707 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. See the Data Exception Report in the miscellaneous section of the data package.

**QC Sample Designation**
Sample 348269001 (CAMO-14-75543) was designated for spike analysis.

**Matrix Spike (PS) Recovery Statement**
The spike 1203094007 (CAMO-14-75543) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

**Matrix Spike Duplicate (PSD) Recovery Statement**
The spike duplicate 1203094004 (CAMO-14-75543) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

**Relative Percent Difference (RPD) Statement**
The RPD between the matrix spike pair were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the deliverable.

**Internal Standard (ISTD) Acceptance**
The internal standard responses in all client and quality control samples met the required acceptance criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. Samples 1203094003 (CAMO-14-75543), 1203094004 (CAMO-14-75543), 1203094007 (CAMO-14-75543), 1203094008 (CAMO-14-75543) and 348530003 (CAMO-14-75545) were not analyzed within the recommended holding. However, the samples were analyzed within two times the holding period. This satisfies the client criteria.

**Sample Preservation and Integrity**
All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Sample 348530003 (CAMO-14-75545) was re-analyzed due to unacceptable surrogate or internal standard recoveries in the initial analysis.

**Miscellaneous Information**

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1299231.

**Manual Integrations**
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

**TIC Comment**
Tentatively identified compounds (TIC) were requested for this sample delivery group/work order. Please note that non-requested target analytes that are reported on the quantitation reports will be present on the Form I. These detected analytes are included in the calibrated method and as a result will be reported on the Sample Data Summary (Form I) or Certificate of Analysis (C of A). TIC data are included on the Sample Data Summary (Form I).

**Additional Comments**
Additional comments were not required for this SDG.

**Residual Chlorine**
Residual Chlorine was not detected in any of the samples in this SDG.

**System Configuration**

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| VOA6.I | Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler | HP6890N/HP5975 | DB-624 | J&W, 60m x 0.25mm x 1.4um | Trap 10 |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3375  GEL Work Order: 348530

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

H  Analytical holding time was exceeded

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert  **Name: Erin Haubert**

**Date: 03 JUN 2014**  **Title: Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530003** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75545** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 15:52** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 15:52** | | | | |
| **Data File:** | **052414V6\6J611.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | HU | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530003** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75545** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 15:52** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 15:52** | | | | |
| **Data File:** | **052414V6\6J611.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530003** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75545** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 15:52** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 15:52** | | | | |
| **Data File:** | **052414V6\6J611.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.8 | 50.0 | ug/L | 97.7 | (78%-124%) |
| Bromofluorobenzene | 50.7 | 50.0 | ug/L | 101 | (80%-120%) |
| Toluene-d8 | 50.4 | 50.0 | ug/L | 101 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown siloxane | 11.452 | 8.73 | ug/L | 0 | J |
| | unknown siloxane | 13.848 | 5.42 | ug/L | 0 | J |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530005** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75541** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 19:42** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 19:42** | | | | |
| **Data File:** | **052314V6\6J516.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530005** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75541** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 19:42** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 19:42** | | | | |
| **Data File:** | **052314V6\6J516.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530005** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75541** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 19:42** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 19:42** | | | | |
| **Data File:** | **052314V6\6J516.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.0 | 50.0 | ug/L | 106 | (78%-124%) |
| Bromofluorobenzene | 50.9 | 50.0 | ug/L | 102 | (80%-120%) |
| Toluene-d8 | 49.7 | 50.0 | ug/L | 99.5 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown siloxane | 13.848 | 7.6 | ug/L | 0 | J |

# Quality Control Summary

**Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-3375**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|---|---|---|---|---|
| 1203094005 | LCS for batch 1390101 | 102 | 102 | 95 |
| 1203094006 | LCS for batch 1390101 | 96 | 96 | 93 |
| 1203094002 | MB for batch 1390101 | 102 | 99 | 100 |
| 348530005 | CAMO-14-75541 | 106 | 99 | 102 |
| 1203094003 | CAMO-14-75543PS | 107 | 110 | 95 |
| 1203094004 | CAMO-14-75543PSD | 100 | 100 | 93 |
| 1203094007 | CAMO-14-75543PS | 107 | 103 | 98 |
| 1203094008 | CAMO-14-75543PSD | 107 | 98 | 98 |
| 1203099706 | LCS for batch 1390101 | 100 | 105 | 92 |
| 1203099707 | LCS for batch 1390101 | 97 | 99 | 107 |
| 1203099705 | MB for batch 1390101 | 101 | 100 | 97 |
| 348530003 | CAMO-14-75545 | 98 | 101 | 101 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| DCED4 | = 1,2-Dichloroethane-d4 | (78%-124%) |
| TOL | = Toluene-d8 | (80%-120%) |
| BFB | = Bromofluorobenzene | (80%-120%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PS**
**Lab Sample ID** **1203094003**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 22:06**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PS | m,p-Xylenes | 100 | 0.00 | HU | 96.3 | 96 | 72-120 |
| 75-05-8 | PS | Acetonitrile | 1250 | 0.00 | HU | 881 | 70 | 61-135 |
| 67-64-1 | PS | Acetone | 250 | 0.00 | HU | 88.3 | 35 | 29-144 |
| 74-88-4 | PS | Iodomethane | 250 | 0.00 | HU | 259 | 104 | 73-120 |
| 75-15-0 | PS | Carbon disulfide | 250 | 0.00 | HU | 231 | 93 | 79-138 |
| 108-05-4 | PS | Vinyl acetate | 250 | 0.00 | HU | 249 | 100 | 60-136 |
| 78-93-3 | PS | 2-Butanone | 250 | 0.00 | HU | 124 | 50 | 38-136 |
| 108-10-1 | PS | 4-Methyl-2-pentanone | 250 | 0.00 | HU | 209 | 84 | 70-132 |
| 591-78-6 | PS | 2-Hexanone | 250 | 0.00 | HU | 146 | 58 | 48-137 |
| 75-71-8 | PS | Dichlorodifluoromethane | 50.0 | 0.00 | HU | 54.7 | 109 | 51-133 |
| 74-87-3 | PS | Chloromethane | 50.0 | 0.00 | HU | 51.6 | 103 | 54-135 |
| 75-01-4 | PS | Vinyl chloride | 50.0 | 0.00 | HU | 55.5 | 111 | 52-129 |
| 74-83-9 | PS | Bromomethane | 50.0 | 0.00 | HU | 51.5 | 103 | 67-128 |
| 75-00-3 | PS | Chloroethane | 50.0 | 0.00 | HU | 47.2 | 94 | 69-120 |
| 75-69-4 | PS | Trichlorofluoromethane | 50.0 | 0.00 | HU | 58.3 | 117 | 66-126 |
| 60-29-7 | PS | Ethyl ether | 50.0 | 0.00 | HU | 43.2 | 86 | 69-120 |
| 75-35-4 | PS | 1,1-Dichloroethylene | 50.0 | 0.00 | HU | 43.2 | 86 | 74-130 |
| 75-09-2 | PS | Methylene chloride | 50.0 | 0.00 | HU | 46.2 | 92 | 73-120 |
| 1634-04-4 | PS | tert-Butyl methyl ether | 50.0 | 0.00 | HU | 48.7 | 97 | 71-124 |
| 156-60-5 | PS | trans-1,2-Dichloroethylene | 50.0 | 0.00 | HU | 43.1 | 86 | 75-124 |
| 75-34-3 | PS | 1,1-Dichloroethane | 50.0 | 0.00 | HU | 44.5 | 89 | 76-122 |
| 156-59-2 | PS | cis-1,2-Dichloroethylene | 50.0 | 0.00 | HU | 45.2 | 90 | 77-121 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PS**
**Lab Sample ID** **1203094003**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 22:06**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PS | 2,2-Dichloropropane | 50.0 | 0.00 | HU | 49.8 | 100 | 72-129 |
| 74-97-5 | PS | Bromochloromethane | 50.0 | 0.00 | HU | 50.9 | 102 | 78-122 |
| 67-66-3 | PS | Chloroform | 50.0 | 0.00 | HU | 49.3 | 99 | 75-123 |
| 71-55-6 | PS | 1,1,1-Trichloroethane | 50.0 | 0.00 | HU | 52.2 | 104 | 76-129 |
| 563-58-6 | PS | 1,1-Dichloropropene | 50.0 | 0.00 | HU | 44.1 | 88 | 76-125 |
| 56-23-5 | PS | Carbon tetrachloride | 50.0 | 0.00 | HU | 55.2 | 110 | 76-132 |
| 107-06-2 | PS | 1,2-Dichloroethane | 50.0 | 0.00 | HU | 48.9 | 98 | 68-128 |
| 71-43-2 | PS | Benzene | 50.0 | 0.00 | HU | 44.5 | 89 | 75-120 |
| 79-01-6 | PS | Trichloroethylene | 50.0 | 0.00 | HU | 47.6 | 95 | 75-125 |
| 78-87-5 | PS | 1,2-Dichloropropane | 50.0 | 0.00 | HU | 49.1 | 98 | 75-120 |
| 74-95-3 | PS | Dibromomethane | 50.0 | 0.00 | HU | 53.0 | 106 | 77-122 |
| 75-27-4 | PS | Bromodichloromethane | 50.0 | 0.00 | HU | 58.4 | 117 | 76-129 |
| 10061-01-5 | PS | cis-1,3-Dichloropropylene | 50.0 | 0.00 | HU | 52.8 | 106 | 75-127 |
| 108-88-3 | PS | Toluene | 50.0 | 0.00 | HU | 48.6 | 97 | 72-120 |
| 10061-02-6 | PS | trans-1,3-Dichloropropylene | 50.0 | 0.00 | HU | 47.5 | 95 | 73-123 |
| 79-00-5 | PS | 1,1,2-Trichloroethane | 50.0 | 0.00 | HU | 43.2 | 86 | 77-120 |
| 142-28-9 | PS | 1,3-Dichloropropane | 50.0 | 0.00 | HU | 43.2 | 86 | 73-120 |
| 127-18-4 | PS | Tetrachloroethylene | 50.0 | 0.00 | HU | 50.8 | 102 | 67-124 |
| 124-48-1 | PS | Dibromochloromethane | 50.0 | 0.00 | HU | 54.4 | 109 | 70-130 |
| 106-93-4 | PS | 1,2-Dibromoethane | 50.0 | 0.00 | HU | 47.2 | 94 | 79-122 |
| 108-90-7 | PS | Chlorobenzene | 50.0 | 0.00 | HU | 47.4 | 95 | 74-120 |
| 100-41-4 | PS | Ethylbenzene | 50.0 | 0.00 | HU | 46.6 | 93 | 72-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PS**
**Lab Sample ID** **1203094003**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 22:06**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 95-47-6 | PS | o-Xylene | 50.0 | 0.00 | HU | 47.8 | 96 | 72-120 |
| 100-42-5 | PS | Styrene | 50.0 | 0.00 | HU | 50.2 | 100 | 74-124 |
| 75-25-2 | PS | Bromoform | 50.0 | 0.00 | HU | 49.6 | 99 | 61-135 |
| 98-82-8 | PS | Isopropylbenzene | 50.0 | 0.00 | HU | 45.7 | 91 | 71-124 |
| 79-34-5 | PS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | HU | 43.7 | 87 | 74-124 |
| 96-18-4 | PS | 1,2,3-Trichloropropane | 50.0 | 0.00 | HU | 43.7 | 87 | 71-125 |
| 108-86-1 | PS | Bromobenzene | 50.0 | 0.00 | HU | 47.3 | 95 | 72-120 |
| 103-65-1 | PS | n-Propylbenzene | 50.0 | 0.00 | HU | 45.2 | 90 | 69-121 |
| 108-67-8 | PS | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | HU | 48.2 | 96 | 71-123 |
| 95-49-8 | PS | 2-Chlorotoluene | 50.0 | 0.00 | HU | 46.6 | 93 | 71-120 |
| 106-43-4 | PS | 4-Chlorotoluene | 50.0 | 0.00 | HU | 46.1 | 92 | 70-120 |
| 98-06-6 | PS | tert-Butylbenzene | 50.0 | 0.00 | HU | 48.9 | 98 | 72-124 |
| 95-63-6 | PS | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | HU | 46.7 | 93 | 71-122 |
| 135-98-8 | PS | sec-Butylbenzene | 50.0 | 0.00 | HU | 46.3 | 93 | 71-124 |
| 99-87-6 | PS | 4-Isopropyltoluene | 50.0 | 0.00 | HU | 48.3 | 97 | 70-124 |
| 541-73-1 | PS | 1,3-Dichlorobenzene | 50.0 | 0.00 | HU | 49.0 | 98 | 70-120 |
| 106-46-7 | PS | 1,4-Dichlorobenzene | 50.0 | 0.00 | HU | 45.2 | 90 | 70-120 |
| 104-51-8 | PS | n-Butylbenzene | 50.0 | 0.00 | HU | 47.2 | 94 | 69-125 |
| 96-12-8 | PS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 | HU | 45.3 | 91 | 60-130 |
| 87-68-3 | PS | Hexachlorobutadiene | 50.0 | 0.00 | HU | 52.8 | 106 | 60-129 |
| 91-20-3 | PS | Naphthalene | 50.0 | 0.00 | HU | 41.4 | 83 | 58-134 |
| 87-61-6 | PS | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | HU | 48.9 | 98 | 52-132 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Sample Type:** **Post Spike**
**Client ID:** **CAMO-14-75543PS**
**Matrix:** **W**
**Lab Sample ID** **1203094003**
**Instrument:** **VOA6.I**
**Analysis Date:** **05/23/2014 22:06**
**Dilution: 1**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 120-82-1 | PS | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | HU | 48.6 | 97 | 59-126 |
| 630-20-6 | PS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | HU | 54.3 | 109 | 78-128 |
| 95-50-1 | PS | 1,2-Dichlorobenzene | 50.0 | 0.00 | HU | 47.7 | 95 | 72-120 |
| 71-36-3 | PS | n-Butyl alcohol | 5000 | 0.00 | HU | 3750 | 75 | 64-138 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PSD**
**Lab Sample ID** **1203094004**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 22:35**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PSD | m,p-Xylenes | 100 | 0.00 | HU | 96.7 | 97 | 72-120 | 0 | 0-20 |
| 75-05-8 | PSD | Acetonitrile | 1250 | 0.00 | HU | 847 | 68 | 61-135 | 4 | 0-20 |
| 67-64-1 | PSD | Acetone | 250 | 0.00 | HU | 81.5 | 33 | 29-144 | 8 | 0-20 |
| 74-88-4 | PSD | Iodomethane | 250 | 0.00 | HU | 252 | 101 | 73-120 | 3 | 0-20 |
| 75-15-0 | PSD | Carbon disulfide | 250 | 0.00 | HU | 237 | 95 | 79-138 | 2 | 0-20 |
| 108-05-4 | PSD | Vinyl acetate | 250 | 0.00 | HU | 240 | 96 | 60-136 | 3 | 0-20 |
| 78-93-3 | PSD | 2-Butanone | 250 | 0.00 | HU | 113 | 45 | 38-136 | 10 | 0-20 |
| 108-10-1 | PSD | 4-Methyl-2-pentanone | 250 | 0.00 | HU | 168 | 67 * | 70-132 | 22 * | 0-20 |
| 591-78-6 | PSD | 2-Hexanone | 250 | 0.00 | HU | 132 | 53 | 48-137 | 10 | 0-20 |
| 75-71-8 | PSD | Dichlorodifluoromethane | 50.0 | 0.00 | HU | 46.4 | 93 | 51-133 | 16 | 0-20 |
| 74-87-3 | PSD | Chloromethane | 50.0 | 0.00 | HU | 44.9 | 90 | 54-135 | 14 | 0-20 |
| 75-01-4 | PSD | Vinyl chloride | 50.0 | 0.00 | HU | 48.8 | 98 | 52-129 | 13 | 0-20 |
| 74-83-9 | PSD | Bromomethane | 50.0 | 0.00 | HU | 54.0 | 108 | 67-128 | 5 | 0-20 |
| 75-00-3 | PSD | Chloroethane | 50.0 | 0.00 | HU | 50.9 | 102 | 69-120 | 8 | 0-20 |
| 75-69-4 | PSD | Trichlorofluoromethane | 50.0 | 0.00 | HU | 57.3 | 115 | 66-126 | 2 | 0-20 |
| 60-29-7 | PSD | Ethyl ether | 50.0 | 0.00 | HU | 44.9 | 90 | 69-120 | 4 | 0-20 |
| 75-35-4 | PSD | 1,1-Dichloroethylene | 50.0 | 0.00 | HU | 43.5 | 87 | 74-130 | 1 | 0-20 |
| 75-09-2 | PSD | Methylene chloride | 50.0 | 0.00 | HU | 48.9 | 98 | 73-120 | 6 | 0-20 |
| 1634-04-4 | PSD | tert-Butyl methyl ether | 50.0 | 0.00 | HU | 44.5 | 89 | 71-124 | 9 | 0-20 |
| 156-60-5 | PSD | trans-1,2-Dichloroethylene | 50.0 | 0.00 | HU | 43.5 | 87 | 75-124 | 1 | 0-20 |
| 75-34-3 | PSD | 1,1-Dichloroethane | 50.0 | 0.00 | HU | 45.2 | 90 | 76-122 | 1 | 0-20 |
| 156-59-2 | PSD | cis-1,2-Dichloroethylene | 50.0 | 0.00 | HU | 44.7 | 89 | 77-121 | 1 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PSD**
**Lab Sample ID** **1203094004**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 22:35**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PSD | 2,2-Dichloropropane | 50.0 | 0.00 | HU | 48.4 | 97 | 72-129 | 3 | 0-20 |
| 74-97-5 | PSD | Bromochloromethane | 50.0 | 0.00 | HU | 48.7 | 97 | 78-122 | 4 | 0-20 |
| 67-66-3 | PSD | Chloroform | 50.0 | 0.00 | HU | 48.4 | 97 | 75-123 | 2 | 0-20 |
| 71-55-6 | PSD | 1,1,1-Trichloroethane | 50.0 | 0.00 | HU | 50.0 | 100 | 76-129 | 4 | 0-20 |
| 563-58-6 | PSD | 1,1-Dichloropropene | 50.0 | 0.00 | HU | 44.1 | 88 | 76-125 | 0 | 0-20 |
| 56-23-5 | PSD | Carbon tetrachloride | 50.0 | 0.00 | HU | 52.3 | 105 | 76-132 | 5 | 0-20 |
| 107-06-2 | PSD | 1,2-Dichloroethane | 50.0 | 0.00 | HU | 45.0 | 90 | 68-128 | 8 | 0-20 |
| 71-43-2 | PSD | Benzene | 50.0 | 0.00 | HU | 44.2 | 88 | 75-120 | 1 | 0-20 |
| 79-01-6 | PSD | Trichloroethylene | 50.0 | 0.00 | HU | 46.0 | 92 | 75-125 | 3 | 0-20 |
| 78-87-5 | PSD | 1,2-Dichloropropane | 50.0 | 0.00 | HU | 36.9 | 74 * | 75-120 | 28 * | 0-20 |
| 74-95-3 | PSD | Dibromomethane | 50.0 | 0.00 | HU | 38.9 | 78 | 77-122 | 31 * | 0-20 |
| 75-27-4 | PSD | Bromodichloromethane | 50.0 | 0.00 | HU | 43.7 | 87 | 76-129 | 29 * | 0-20 |
| 10061-01-5 | PSD | cis-1,3-Dichloropropylene | 50.0 | 0.00 | HU | 40.0 | 80 | 75-127 | 28 * | 0-20 |
| 108-88-3 | PSD | Toluene | 50.0 | 0.00 | HU | 44.6 | 89 | 72-120 | 9 | 0-20 |
| 10061-02-6 | PSD | trans-1,3-Dichloropropylene | 50.0 | 0.00 | HU | 46.3 | 93 | 73-123 | 3 | 0-20 |
| 79-00-5 | PSD | 1,1,2-Trichloroethane | 50.0 | 0.00 | HU | 41.4 | 83 | 77-120 | 4 | 0-20 |
| 142-28-9 | PSD | 1,3-Dichloropropane | 50.0 | 0.00 | HU | 41.9 | 84 | 73-120 | 3 | 0-20 |
| 127-18-4 | PSD | Tetrachloroethylene | 50.0 | 0.00 | HU | 51.0 | 102 | 67-124 | 0 | 0-20 |
| 124-48-1 | PSD | Dibromochloromethane | 50.0 | 0.00 | HU | 52.0 | 104 | 70-130 | 4 | 0-20 |
| 106-93-4 | PSD | 1,2-Dibromoethane | 50.0 | 0.00 | HU | 45.2 | 90 | 79-122 | 4 | 0-20 |
| 108-90-7 | PSD | Chlorobenzene | 50.0 | 0.00 | HU | 47.8 | 96 | 74-120 | 1 | 0-20 |
| 100-41-4 | PSD | Ethylbenzene | 50.0 | 0.00 | HU | 46.0 | 92 | 72-120 | 1 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PSD**
**Lab Sample ID** **1203094004**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 22:35**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-47-6 | PSD | o-Xylene | 50.0 | 0.00 | HU | 48.8 | 98 | 72-120 | 2 | 0-20 |
| 100-42-5 | PSD | Styrene | 50.0 | 0.00 | HU | 51.3 | 103 | 74-124 | 2 | 0-20 |
| 75-25-2 | PSD | Bromoform | 50.0 | 0.00 | HU | 51.4 | 103 | 61-135 | 4 | 0-20 |
| 98-82-8 | PSD | Isopropylbenzene | 50.0 | 0.00 | HU | 46.3 | 93 | 71-124 | 1 | 0-20 |
| 79-34-5 | PSD | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | HU | 39.4 | 79 | 74-124 | 10 | 0-20 |
| 96-18-4 | PSD | 1,2,3-Trichloropropane | 50.0 | 0.00 | HU | 41.7 | 83 | 71-125 | 5 | 0-20 |
| 108-86-1 | PSD | Bromobenzene | 50.0 | 0.00 | HU | 48.9 | 98 | 72-120 | 3 | 0-20 |
| 103-65-1 | PSD | n-Propylbenzene | 50.0 | 0.00 | HU | 45.5 | 91 | 69-121 | 1 | 0-20 |
| 108-67-8 | PSD | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | HU | 49.7 | 99 | 71-123 | 3 | 0-20 |
| 95-49-8 | PSD | 2-Chlorotoluene | 50.0 | 0.00 | HU | 46.9 | 94 | 71-120 | 1 | 0-20 |
| 106-43-4 | PSD | 4-Chlorotoluene | 50.0 | 0.00 | HU | 44.1 | 88 | 70-120 | 4 | 0-20 |
| 98-06-6 | PSD | tert-Butylbenzene | 50.0 | 0.00 | HU | 49.7 | 99 | 72-124 | 2 | 0-20 |
| 95-63-6 | PSD | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | HU | 50.3 | 101 | 71-122 | 7 | 0-20 |
| 135-98-8 | PSD | sec-Butylbenzene | 50.0 | 0.00 | HU | 46.4 | 93 | 71-124 | 0 | 0-20 |
| 99-87-6 | PSD | 4-Isopropyltoluene | 50.0 | 0.00 | HU | 49.0 | 98 | 70-124 | 1 | 0-20 |
| 541-73-1 | PSD | 1,3-Dichlorobenzene | 50.0 | 0.00 | HU | 46.7 | 93 | 70-120 | 5 | 0-20 |
| 106-46-7 | PSD | 1,4-Dichlorobenzene | 50.0 | 0.00 | HU | 45.0 | 90 | 70-120 | 0 | 0-20 |
| 104-51-8 | PSD | n-Butylbenzene | 50.0 | 0.00 | HU | 46.4 | 93 | 69-125 | 2 | 0-20 |
| 96-12-8 | PSD | 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 | HU | 44.8 | 90 | 60-130 | 1 | 0-20 |
| 87-68-3 | PSD | Hexachlorobutadiene | 50.0 | 0.00 | HU | 58.5 | 117 | 60-129 | 10 | 0-20 |
| 91-20-3 | PSD | Naphthalene | 50.0 | 0.00 | HU | 46.1 | 92 | 58-134 | 11 | 0-20 |
| 87-61-6 | PSD | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | HU | 53.1 | 106 | 52-132 | 8 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PSD**
**Lab Sample ID** **1203094004**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 22:35**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-82-1 | PSD | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | HU | 53.5 | 107 | 59-126 | 10 | 0-20 |
| 630-20-6 | PSD | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | HU | 53.5 | 107 | 78-128 | 2 | 0-20 |
| 95-50-1 | PSD | 1,2-Dichlorobenzene | 50.0 | 0.00 | HU | 47.5 | 95 | 72-120 | 1 | 0-20 |
| 71-36-3 | PSD | n-Butyl alcohol | 5000 | 0.00 | HU | 3350 | 67 | 64-138 | 11 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203094005**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/23/2014 14:52**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 97.5 | 98 | 80-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 1070 | 86 | 63-131 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 278 | 111 | 50-149 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 258 | 103 | 75-120 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 253 | 101 | 80-136 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 304 | 122 | 78-130 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 271 | 108 | 57-148 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 229 | 91 | 75-130 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 266 | 106 | 64-149 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 49.2 | 98 | 58-129 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 47.6 | 95 | 59-131 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 52.2 | 104 | 59-127 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 53.1 | 106 | 70-125 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 54.1 | 108 | 73-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 60.3 | 121 | 73-123 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 47.3 | 95 | 73-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 46.6 | 93 | 80-128 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 47.5 | 95 | 75-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 48.3 | 97 | 74-122 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 45.7 | 91 | 80-121 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 46.5 | 93 | 79-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 46.5 | 93 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203094005**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/23/2014 14:52**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 52.0 | 104 | 79-130 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 50.1 | 100 | 80-121 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 48.2 | 96 | 79-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 51.3 | 103 | 80-128 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 46.7 | 93 | 80-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 53.2 | 106 | 80-131 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 45.5 | 91 | 73-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 45.5 | 91 | 78-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 46.4 | 93 | 80-121 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 42.3 | 85 | 79-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 44.1 | 88 | 80-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 42.6 | 85 | 80-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 40.8 | 82 | 80-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 45.3 | 91 | 78-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 48.1 | 96 | 79-121 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 44.0 | 88 | 78-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 43.1 | 86 | 75-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 52.4 | 105 | 74-123 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 52.7 | 105 | 73-129 |
| 106-93-4 | LCS | 1,2-Dibromoethane | 50.0 | 0.0 | 48.3 | 97 | 80-120 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 47.8 | 96 | 79-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 47.0 | 94 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203094005**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/23/2014 14:52**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 47.7 | 95 | 80-123 |
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 50.7 | 101 | 80-121 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 54.7 | 109 | 65-135 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 47.6 | 95 | 79-121 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 44.5 | 89 | 76-123 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 45.0 | 90 | 76-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 47.5 | 95 | 79-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 46.6 | 93 | 80-123 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 49.4 | 99 | 80-120 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 47.0 | 94 | 79-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 45.4 | 91 | 79-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 51.5 | 103 | 79-122 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 48.1 | 96 | 80-120 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 49.1 | 98 | 80-121 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 51.7 | 103 | 80-121 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 47.5 | 95 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 46.3 | 93 | 78-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 50.5 | 101 | 80-123 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.0 | 54.9 | 110 | 66-125 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 65.0 | 130 * | 71-128 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 53.6 | 107 | 64-132 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 60.7 | 121 | 61-132 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203094005**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/23/2014 14:52**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 60.3 | 121 | 66-130 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 52.5 | 105 | 80-125 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 48.1 | 96 | 78-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4760 | 95 | 67-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203094006**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/23/2014 16:19**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 300 | 120 | 65-126 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 270 | 108 | 73-132 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 231 | 92 | 67-127 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 216 | 86 | 74-122 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 216 | 87 | 73-124 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 223 | 89 | 68-123 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 235 | 94 | 79-120 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 241 | 96 | 77-120 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 2000 | 80 | 72-133 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 51.6 | 103 | 57-142 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PS**
**Lab Sample ID** **1203094007**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 23:03**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PS | Acrolein | 250 | 0.00 | HU | 350 | 140 * | 57-131 |
| 76-13-1 | PS | Trichlorotrifluoroethane | 250 | 0.00 | HU | 295 | 118 | 76-133 |
| 107-05-1 | PS | Allyl chloride | 250 | 0.00 | HU | 266 | 107 | 65-130 |
| 107-13-1 | PS | Acrylonitrile | 250 | 0.00 | HU | 256 | 102 | 70-128 |
| 107-12-0 | PS | Propionitrile | 250 | 0.00 | HU | 207 | 83 | 68-131 |
| 126-98-7 | PS | Methacrylonitrile | 250 | 0.00 | HU | 220 | 88 | 64-129 |
| 80-62-6 | PS | Methyl methacrylate | 250 | 0.00 | HU | 229 | 91 | 76-120 |
| 97-63-2 | PS | Ethyl methacrylate | 250 | 0.00 | HU | 246 | 99 | 72-122 |
| 78-83-1 | PS | Isobutyl alcohol | 2500 | 0.00 | HU | 1870 | 75 | 72-134 |
| 126-99-8 | PS | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | HU | 56.0 | 112 | 46-140 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75543PSD**
**Lab Sample ID** **1203094008**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/23/2014 23:32**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PSD | Acrolein | 250 | 0.00 | HU | 273 | 109 | 57-131 | 25 * | 0-20 |
| 76-13-1 | PSD | Trichlorotrifluoroethane | 250 | 0.00 | HU | 253 | 101 | 76-133 | 16 | 0-20 |
| 107-05-1 | PSD | Allyl chloride | 250 | 0.00 | HU | 221 | 89 | 65-130 | 19 | 0-20 |
| 107-13-1 | PSD | Acrylonitrile | 250 | 0.00 | HU | 204 | 81 | 70-128 | 23 * | 0-20 |
| 107-12-0 | PSD | Propionitrile | 250 | 0.00 | HU | 203 | 81 | 68-131 | 2 | 0-20 |
| 126-98-7 | PSD | Methacrylonitrile | 250 | 0.00 | HU | 230 | 92 | 64-129 | 4 | 0-20 |
| 80-62-6 | PSD | Methyl methacrylate | 250 | 0.00 | HU | 239 | 96 | 76-120 | 5 | 0-20 |
| 97-63-2 | PSD | Ethyl methacrylate | 250 | 0.00 | HU | 222 | 89 | 72-122 | 11 | 0-20 |
| 78-83-1 | PSD | Isobutyl alcohol | 2500 | 0.00 | HU | 1930 | 77 | 72-134 | 3 | 0-20 |
| 126-99-8 | PSD | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | HU | 49.6 | 99 | 46-140 | 12 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203099706**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/24/2014 12:00**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 94.2 | 94 | 80-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 1130 | 90 | 63-131 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 271 | 108 | 50-149 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 285 | 114 | 75-120 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 277 | 111 | 80-136 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 328 | 131 * | 78-130 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 268 | 107 | 57-148 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 204 | 82 | 75-130 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 232 | 93 | 64-149 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 56.8 | 114 | 58-129 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 53.3 | 107 | 59-131 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 58.3 | 117 | 59-127 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 59.5 | 119 | 70-125 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 59.6 | 119 | 73-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 68.5 | 137 * | 73-123 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 50.9 | 102 | 73-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 51.0 | 102 | 80-128 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 52.4 | 105 | 75-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 52.3 | 105 | 74-122 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 49.8 | 100 | 80-121 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 50.9 | 102 | 79-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 50.4 | 101 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203099706**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/24/2014 12:00**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 57.1 | 114 | 79-130 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 53.7 | 107 | 80-121 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 52.6 | 105 | 79-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 54.9 | 110 | 80-128 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 44.2 | 88 | 80-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 53.3 | 107 | 80-131 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 44.2 | 88 | 73-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 42.4 | 85 | 78-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 46.5 | 93 | 80-121 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 41.3 | 83 | 79-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 45.1 | 90 | 80-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 48.6 | 97 | 80-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 46.1 | 92 | 80-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 46.5 | 93 | 78-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 45.7 | 91 | 79-121 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 41.8 | 84 | 78-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 40.8 | 82 | 75-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 51.0 | 102 | 74-123 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 50.6 | 101 | 73-129 |
| 106-93-4 | LCS | 1,2-Dibromoethane | 50.0 | 0.0 | 45.9 | 92 | 80-120 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 47.9 | 96 | 79-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 49.5 | 99 | 79-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203099706**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/24/2014 12:00**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 46.4 | 93 | 80-123 |
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 49.1 | 98 | 80-121 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 52.3 | 105 | 65-135 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 45.9 | 92 | 79-121 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 42.0 | 84 | 76-123 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 43.9 | 88 | 76-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 45.6 | 91 | 79-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 45.4 | 91 | 80-123 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 49.7 | 99 | 80-120 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 46.0 | 92 | 79-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 44.1 | 88 | 79-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 49.6 | 99 | 79-122 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 49.8 | 100 | 80-120 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 47.4 | 95 | 80-121 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 50.5 | 101 | 80-121 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 46.5 | 93 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 44.4 | 89 | 78-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 49.2 | 98 | 80-123 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.0 | 53.6 | 107 | 66-125 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 63.5 | 127 | 71-128 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 50.9 | 102 | 64-132 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 63.3 | 127 | 61-132 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203099706**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/24/2014 12:00**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 57.6 | 115 | 66-130 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 54.3 | 109 | 80-125 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 46.6 | 93 | 78-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4140 | 83 | 67-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1390101**
**Lab Sample ID** **1203099707**
**Instrument:** **VOA6.I**
**Analyst:** **GRB2**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/24/2014 13:27**
**Dilution: 1**
**Batch ID:** **1390101**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 328 | 131 * | 65-126 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 269 | 108 | 73-132 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 239 | 96 | 67-127 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 236 | 94 | 74-122 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 236 | 94 | 73-124 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 238 | 95 | 68-123 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 243 | 97 | 79-120 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 257 | 103 | 77-120 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 2190 | 88 | 72-133 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 51.9 | 104 | 57-142 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1390101** | **Instrument ID:** | **VOA6.I** | **Data File:** | **052314V6\6J511BAR.D** |
| **Lab Sample ID:** | **1203094002** | **Prep Date:** | **05/23/2014 17:17** | **Analyzed:** | **05/23/14 17:17** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1390101 | 1203094005 | 052314V6\6J506LAR.D | 05/23/14 | 1452 |
| 02 LCS for batch 1390101 | 1203094006 | 052314V6\6J509SHAR.D | 05/23/14 | 1619 |
| 03 CAMO-14-75541 | 348530005 | 052314V6\6J516.D | 05/23/14 | 1942 |
| 04 CAMO-14-75543PS | 1203094003 | 052314V6\6J521.D | 05/23/14 | 2206 |
| 05 CAMO-14-75543PSD | 1203094004 | 052314V6\6J522.D | 05/23/14 | 2235 |
| 06 CAMO-14-75543PS | 1203094007 | 052314V6\6J523.D | 05/23/14 | 2303 |
| 07 CAMO-14-75543PSD | 1203094008 | 052314V6\6J524.D | 05/23/14 | 2332 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1390101** | **Instrument ID:** | **VOA6.I** | **Data File:** | **052414V6\6J608BAR.D** |
| **Lab Sample ID:** | **1203099705** | **Prep Date:** | **05/24/2014 14:25** | **Analyzed:** | **05/24/14 14:25** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 09 LCS for batch 1390101 | 1203099706 | 052414V6\6J603LAR.D | 05/24/14 | 1200 |
| 10 LCS for batch 1390101 | 1203099707 | 052414V6\6J606SHAR.D | 05/24/14 | 1327 |
| 11 CAMO-14-75545 | 348530003 | 052414V6\6J611.D | 05/24/14 | 1552 |

# Quality Control Data

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094002** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 17:17** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 17:17** | | | | |
| **Data File:** | **052314V6\6J511BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094002** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 17:17** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 17:17** | | | | |
| **Data File:** | **052314V6\6J511BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094002** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 17:17** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 17:17** | | | | |
| **Data File:** | **052314V6\6J511BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.8 | 50.0 | ug/L | 102 | (78%-124%) |
| Bromofluorobenzene | 49.9 | 50.0 | ug/L | 99.8 | (80%-120%) |
| Toluene-d8 | 49.6 | 50.0 | ug/L | 99.3 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094003** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 22:06** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 22:06** | | | | |
| **Data File:** | **052314V6\6J521.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | H | 54.3 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | H | 52.2 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | H | 43.7 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | H | 43.2 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | H | 44.5 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | H | 43.2 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | H | 44.1 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | H | 48.9 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | H | 43.7 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | H | 48.6 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | H | 46.7 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | H | 45.3 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | H | 47.2 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | H | 47.7 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | H | 48.9 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | H | 49.1 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | H | 48.2 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | H | 49.0 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | H | 43.2 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | H | 45.2 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | H | 49.8 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | H | 124 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | H | 46.6 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | H | 146 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | H | 46.1 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | H | 48.3 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | H | 209 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | H | 88.3 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | H | 881 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | H | 44.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | H | 47.3 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | H | 50.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | H | 58.4 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | H | 49.6 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094003** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 22:06** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 22:06** | | | | |
| **Data File:** | **052314V6\6J521.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | H | 51.5 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | H | 231 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | H | 55.2 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | H | 47.4 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | H | 47.2 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | H | 49.3 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | H | 51.6 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | H | 54.4 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | H | 53.0 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | H | 54.7 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | H | 43.2 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | H | 46.6 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | H | 52.8 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | H | 259 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | H | 45.7 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | H | 46.2 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | H | 41.4 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | H | 50.2 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | H | 50.8 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | H | 48.6 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | H | 47.6 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | H | 58.3 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | H | 249 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | H | 55.5 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | H | 45.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | H | 52.8 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | H | 96.3 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | H | 3750 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | H | 47.2 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | H | 45.2 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | H | 47.8 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | H | 46.3 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094003** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 22:06** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 22:06** | | | | |
| **Data File:** | **052314V6\6J521.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | H | 48.7 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | H | 48.9 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | H | 43.1 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | H | 47.5 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.4 | 50.0 | ug/L | 107 | (78%-124%) |
| Bromofluorobenzene | 47.5 | 50.0 | ug/L | 94.9 | (80%-120%) |
| Toluene-d8 | 55.0 | 50.0 | ug/L | 110 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094004** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 22:35** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 22:35** | | | | |
| **Data File:** | **052314V6\6J522.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | H | 53.5 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | H | 50.0 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | H | 39.4 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | H | 41.4 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | H | 45.2 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | H | 43.5 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | H | 44.1 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | H | 53.1 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | H | 41.7 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | H | 53.5 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | H | 50.3 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | H | 44.8 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | H | 45.2 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | H | 47.5 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | H | 45.0 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | H | 36.9 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | H | 49.7 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | H | 46.7 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | H | 41.9 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | H | 45.0 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | H | 48.4 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | H | 113 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | H | 46.9 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | H | 132 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | H | 44.1 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | H | 49.0 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | H | 168 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | H | 81.5 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | H | 847 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | H | 44.2 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | H | 48.9 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | H | 48.7 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | H | 43.7 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | H | 51.4 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094004** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 22:35** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 22:35** | | | | |
| **Data File:** | **052314V6\6J522.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | H | 54.0 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | H | 237 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | H | 52.3 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | H | 47.8 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | H | 50.9 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | H | 48.4 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | H | 44.9 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | H | 52.0 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | H | 38.9 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | H | 46.4 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | H | 44.9 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | H | 46.0 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | H | 58.5 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | H | 252 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | H | 46.3 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | H | 48.9 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | H | 46.1 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | H | 51.3 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | H | 51.0 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | H | 44.6 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | H | 46.0 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | H | 57.3 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | H | 240 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | H | 48.8 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | H | 44.7 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | H | 40.0 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | H | 96.7 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | H | 3350 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | H | 46.4 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | H | 45.5 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | H | 48.8 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | H | 46.4 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094004** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 22:35** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 22:35** | | | | |
| **Data File:** | **052314V6\6J522.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | H | 44.5 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | H | 49.7 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | H | 43.5 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | H | 46.3 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.1 | 50.0 | ug/L | 100 | (78%-124%) |
| Bromofluorobenzene | 46.5 | 50.0 | ug/L | 93.1 | (80%-120%) |
| Toluene-d8 | 50.1 | 50.0 | ug/L | 100 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094005** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 14:52** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 14:52** | | | | |
| **Data File:** | **052314V6\6J506LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 52.5 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 51.3 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 44.5 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 44.0 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 46.5 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 46.6 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 46.7 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 60.7 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 45.0 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 60.3 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 48.1 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 54.9 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 48.3 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 48.1 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 45.5 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 42.3 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 49.4 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 47.5 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 43.1 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 46.3 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 52.0 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 271 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 47.0 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 266 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 45.4 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 51.7 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 229 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 278 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 1070 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 45.5 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 47.5 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 50.1 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 42.6 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 54.7 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094005** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 14:52** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 14:52** | | | | |
| **Data File:** | **052314V6\6J506LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 253 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 53.2 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 47.8 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 54.1 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 48.2 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 47.6 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 52.7 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 44.1 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 49.2 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 47.3 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 47.0 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 65.0 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 258 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 47.6 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 47.5 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 53.6 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 50.7 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 52.4 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 45.3 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 46.4 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 60.3 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 304 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 52.2 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 46.5 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 40.8 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 97.5 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4760 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 46.6 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 47.7 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 49.1 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094005** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 14:52** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 14:52** | | | | |
| **Data File:** | **052314V6\6J506LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 48.3 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 51.5 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 45.7 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 48.1 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.8 | 50.0 | ug/L | 102 | (78%-124%) |
| Bromofluorobenzene | 47.6 | 50.0 | ug/L | 95.2 | (80%-120%) |
| Toluene-d8 | 51.0 | 50.0 | ug/L | 102 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094006** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 16:19** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 16:19** | | | | |
| **Data File:** | **052314V6\6J509SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 51.6 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 300 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 216 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 231 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094006** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 16:19** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 16:19** | | | | |
| **Data File:** | **052314V6\6J509SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 241 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2000 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 223 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 235 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 216 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 270 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203094006** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 16:19** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 16:19** | | | | |
| **Data File:** | **052314V6\6J509SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 47.9 | 50.0 | ug/L | 95.9 | (78%-124%) |
| Bromofluorobenzene | 46.4 | 50.0 | ug/L | 92.8 | (80%-120%) |
| Toluene-d8 | 48.1 | 50.0 | ug/L | 96.1 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094007** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 23:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 23:03** | | | | |
| **Data File:** | **052314V6\6J523.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | HU | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | H | 56.0 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | H | 350 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | H | 256 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | H | 266 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094007** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 23:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 23:03** | | | | |
| **Data File:** | **052314V6\6J523.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | H | 246 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | H | 1870 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | H | 220 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | H | 229 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | H | 207 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | H | 295 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094007** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 23:03** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 23:03** | | | | |
| **Data File:** | **052314V6\6J523.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.3 | 50.0 | ug/L | 107 | (78%-124%) |
| Bromofluorobenzene | 48.9 | 50.0 | ug/L | 97.7 | (80%-120%) |
| Toluene-d8 | 51.3 | 50.0 | ug/L | 103 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094008** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 23:32** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 23:32** | | | | |
| **Data File:** | **052314V6\6J524.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | HU | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | H | 49.6 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | H | 273 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | H | 204 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | H | 221 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094008** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 23:32** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 23:32** | | | | |
| **Data File:** | **052314V6\6J524.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | H | 222 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | H | 1930 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | H | 230 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | H | 239 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | H | 203 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | H | 253 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/06/2014 09:45** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203094008** | **Date Received:** | **05/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75543PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/23/2014 23:32** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/23/2014 23:32** | | | | |
| **Data File:** | **052314V6\6J524.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.4 | 50.0 | ug/L | 107 | (78%-124%) |
| Bromofluorobenzene | 48.9 | 50.0 | ug/L | 97.7 | (80%-120%) |
| Toluene-d8 | 49.0 | 50.0 | ug/L | 98.1 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099705** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 14:25** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 14:25** | | | | |
| **Data File:** | **052414V6\6J608BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099705** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 14:25** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 14:25** | | | | |
| **Data File:** | **052414V6\6J608BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099705** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 14:25** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 14:25** | | | | |
| **Data File:** | **052414V6\6J608BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.6 | 50.0 | ug/L | 101 | (78%-124%) |
| Bromofluorobenzene | 48.4 | 50.0 | ug/L | 96.7 | (80%-120%) |
| Toluene-d8 | 50.0 | 50.0 | ug/L | 100 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099706** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 12:00** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 12:00** | | | | |
| **Data File:** | **052414V6\6J603LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 54.3 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 54.9 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 42.0 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 41.8 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 50.9 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 51.0 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 44.2 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 63.3 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 43.9 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 57.6 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 49.8 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 53.6 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 45.9 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 46.6 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 44.2 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 41.3 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 49.7 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 46.5 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 40.8 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 44.4 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 57.1 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 268 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 46.0 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 232 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 44.1 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 50.5 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 204 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 271 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 1130 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 42.4 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 45.6 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 53.7 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 48.6 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 52.3 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099706** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 12:00** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 12:00** | | | | |
| **Data File:** | **052414V6\6J603LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 59.5 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 277 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 53.3 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 47.9 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 59.6 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 52.6 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 53.3 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 50.6 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 45.1 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 56.8 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 50.9 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 49.5 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 63.5 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 285 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 45.9 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 52.4 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 50.9 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 49.1 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 51.0 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 46.5 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 46.5 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 68.5 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 328 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 58.3 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 50.4 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 46.1 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 94.2 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4140 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 49.2 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 45.4 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 46.4 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 47.4 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099706** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 12:00** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 12:00** | | | | |
| **Data File:** | **052414V6\6J603LAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 52.3 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 49.6 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 49.8 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 45.7 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.0 | 50.0 | ug/L | 99.9 | (78%-124%) |
| Bromofluorobenzene | 45.9 | 50.0 | ug/L | 91.8 | (80%-120%) |
| Toluene-d8 | 52.5 | 50.0 | ug/L | 105 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099707** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 13:27** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 13:27** | | | | |
| **Data File:** | **052414V6\6J606SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 51.9 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 328 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 236 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 239 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099707** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 13:27** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 13:27** | | | | |
| **Data File:** | **052414V6\6J606SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 257 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2190 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 238 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 243 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 236 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 269 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203099707** | | | | |
| **Client Sample:** | **QC for batch 1390101** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1390101** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1390101** | **Inst:** | **VOA6.I** | **Dilution:** | **1** |
| **Run Date:** | **05/24/2014 13:27** | **Analyst:** | **GRB2** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **05/24/2014 13:27** | | | | |
| **Data File:** | **052414V6\6J606SHAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.5 | 50.0 | ug/L | 97.1 | (78%-124%) |
| Bromofluorobenzene | 53.5 | 50.0 | ug/L | 107 | (80%-120%) |
| Toluene-d8 | 49.7 | 50.0 | ug/L | 99.4 | (80%-120%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 02-JUN-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| VOA GC/MS | SW846 8260B DOE-AL | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1390101 | See Below | | |

**Potentially affected work order(s)(SDG): 348269(2014-3353),348526(2014-3373),348530(2014-3375),348630(2014-3383),348686(2014-3382)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Sample Analyzed out of Holding

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. QC sample 1203094007MS recovered outside the limits for Acrolein.<br><br>2. The MS/MSD pairs did not all have acceptable RPD values.<br><br>3. Sample Analyzed out of Holding:<br><br>348269 001,002<br>348526 004<br>348530 003<br>QC 1203094003MS, 1203094004MSD, 1203094007MS and 1203094008MSD<br><br>4. The LCS recoveries were not all within the acceptance limits.<br><br>5. QC sample 1203094004MSD recovered outside the limits for 1,2-Dichloropropane and 4-Methyl-2-pentanone. | 1,2 and 5. The MS/MSD pairs were re-analyzed and recovered in similar manners.<br><br>3. The samples were analyzed within two times the hold time criteria, which satisfies the client criteria.<br><br>4. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. |

**Originator's Name:**

Gelester Baskett 02-JUN-14

**Data Validator/Group Leader:**

Erin Haubert 02-JUN-14

# Semi-Volatile Analysis

# Case Narrative

**Semi-Volatile Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3375**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry** |
| Analytical Method: | SW846 3510C/8270D |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1387889 |
| Prep Batch Number: | 1387888 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

| Sample ID | Client ID |
|---|---|
| 348530003 | CAMO-14-75545 |
| 1203088329 | Method Blank (MB) |
| 1203088330 | Laboratory Control Sample (LCS) |
| 1203088331 | 348630001(CAMO-14-75494) Matrix Spike (MS) |
| 1203088332 | 348630001(CAMO-14-75494) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 32.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at

GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

**CCV Requirements**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG in this batch met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Sample 348630001 (CAMO-14-75494) was selected for analysis as the matrix spike and matrix spike duplicate.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPD between the MS and the MSD, 1203088331 (CAMO-14-75494) and 1203088332 (CAMO-14-75494), did not meet the 0% to 30% acceptance limits for Benzidine at 83.8%. The RPD failure is attributed to the large difference in the recovery values between analyte pair in the MS and MSD. The individual LCS, MS and MSD recoveries for this analyte were within their established acceptance criteria. The data are reported unqualified for the RPD value failure.

**Internal Standard (ISTD) Acceptance**
The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

**Sample Dilutions**

The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception report 1293920 was generated for the samples in this batch for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for samples 1203088329 (MB) and 348530003 (CAMO-14-75545) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| MSD2.I | Agilent 7890A/5975C GC/MS w/7683 Autosampler | HP7890A/HP5975C | DB-5MS | 25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3375  GEL Work Order: 348530

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 02 JUN 2014**  **Title: Data Validator**

# Sample Data Summary

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530003** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75545** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 21:42** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1514.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 122-66-7 | Azobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 123-91-1 | 1,4-Dioxane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 90-12-0 | 1-Methylnaphthalene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.8 | ug/L | 5.21 | 20.8 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.04 | ug/L | 0.427 | 1.04 |
| 95-57-8 | 2-Chlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-57-6 | 2-Methylnaphthalene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 88-75-5 | 2-Nitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 59-50-7 | Parachlorometa cresol | U | 10.4 | ug/L | 3.13 | 10.4 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.4 | ug/L | 3.44 | 10.4 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 100-02-7 | 4-Nitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 83-32-9 | Acenaphthene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 208-96-8 | Acenaphthylene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 62-53-3 | Aniline | U | 10.4 | ug/L | 4.38 | 10.4 |
| 120-12-7 | Anthracene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 1912-24-9 | Atrazine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 92-87-5 | Benzidine | U | 10.4 | ug/L | 4.06 | 10.4 |
| 56-55-3 | Benzo(a)anthracene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 50-32-8 | Benzo(a)pyrene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 205-99-2 | Benzo(b)fluoranthene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 191-24-2 | Benzo(ghi)perylene | U | 1.04 | ug/L | 0.313 | 1.04 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530003** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75545** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 21:42** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1514.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 65-85-0 | Benzoic acid | U | 20.8 | ug/L | 6.25 | 20.8 |
| 100-51-6 | Benzyl alcohol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 85-68-7 | Butylbenzylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 218-01-9 | Chrysene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 84-74-2 | Di-n-butylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 117-84-0 | Di-n-octylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 132-64-9 | Dibenzofuran | U | 10.4 | ug/L | 3.13 | 10.4 |
| 84-66-2 | Diethylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 131-11-3 | Dimethylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-85-7 | Dinoseb | U | 10.4 | ug/L | 3.13 | 10.4 |
| 122-39-4 | Diphenylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 206-44-0 | Fluoranthene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 86-73-7 | Fluorene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 118-74-1 | Hexachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 87-68-3 | Hexachlorobutadiene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 67-72-1 | Hexachloroethane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 78-59-1 | Isophorone | U | 10.4 | ug/L | 3.65 | 10.4 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-20-3 | Naphthalene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 98-95-3 | Nitrobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 608-93-5 | Pentachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 87-86-5 | Pentachlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 85-01-8 | Phenanthrene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 108-95-2 | Phenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 129-00-0 | Pyrene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 110-86-1 | Pyridine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.4 | ug/L | 3.13 | 10.4 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/09/2014 11:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **348530003** | **Date Received:** | **05/13/2014 09:20** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAMO-14-75545** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 21:42** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1514.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | U | 10.4 | ug/L | 3.85 | 10.4 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-48-7 | o-Cresol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 94.7 | 104 | ug/L | 90.9 | (26%-129%) |
| 2-Fluorobiphenyl | 43.5 | 52.1 | ug/L | 83.6 | (32%-102%) |
| 2-Fluorophenol | 53.9 | 104 | ug/L | 51.8 | (10%-78%) |
| Nitrobenzene-d5 | 45.6 | 52.1 | ug/L | 87.6 | (36%-125%) |
| Phenol-d5 | 34.9 | 104 | ug/L | 33.5 | (10%-104%) |
| p-Terphenyl-d14 | 40.5 | 52.1 | ug/L | 77.8 | (34%-135%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 082304-66-3 | 7,9-Di-tert-butyl-1-oxaspiro(4,5)d | 12.207 | 9.58 | ug/L | 98 | NJ |
| 000080-05-7 | Phenol, 4,4'-(1-methylethylidene)b | 13.61 | 58.9 | ug/L | 98 | NJ |
| | unknown | 23.076 | 106 | ug/L | 0 | J |

# Quality Control Summary

**Semi-Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-3375**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 2FP %REC | PHL %REC | NBZ %REC | FBP %REC | TBP %REC | TPH %REC |
|---|---|---|---|---|---|---|---|
| 1203088330 | LCS for batch 1387888 | 49 | 32 | 85 | 75 | 88 | 75 |
| 1203088329 | MB for batch 1387888 | 50 | 33 | 83 | 65 | 78 | 86 |
| 348530003 | CAMO-14-75545 | 52 | 33 | 88 | 84 | 91 | 78 |
| 1203088331 | CAMO-14-75494MS | 68 | 56 | 86 | 80 | 89 | 74 |
| 1203088332 | CAMO-14-75494MSD | 74 | 61 | 94 | 86 | 99 | 82 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 2FP | = 2-Fluorophenol | (10%-78%) |
| PHL | = Phenol-d5 | (10%-104%) |
| NBZ | = Nitrobenzene-d5 | (36%-125%) |
| FBP | = 2-Fluorobiphenyl | (32%-102%) |
| TBP | = 2,4,6-Tribromophenol | (26%-129%) |
| TPH | = p-Terphenyl-d14 | (34%-135%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1387888**
**Lab Sample ID** **1203088330**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/15/2014 19:43**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 62-75-9 | LCS | N-Methyl-N-nitrosomethylam | 50.0 | 0.0 | 28.3 | 57 | 18-75 |
| 110-86-1 | LCS | Pyridine | 50.0 | 0.0 | 33.1 | 66 | 11-88 |
| 62-53-3 | LCS | Aniline | 50.0 | 0.0 | 45.2 | 90 | 35-107 |
| 108-95-2 | LCS | Phenol | 50.0 | 0.0 | 17.0 | 34 | 13-77 |
| 111-44-4 | LCS | bis(2-Chloroethyl) ether | 50.0 | 0.0 | 46.4 | 93 | 35-111 |
| 95-57-8 | LCS | 2-Chlorophenol | 50.0 | 0.0 | 38.3 | 77 | 39-99 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 30.2 | 60 | 25-100 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 31.0 | 62 | 24-88 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 31.4 | 63 | 27-87 |
| 108-60-1 | LCS | bis(2-Chloro-1-methylethyl)et | 50.0 | 0.0 | 47.8 | 96 | 23-120 |
| 100-51-6 | LCS | Benzyl alcohol | 50.0 | 0.0 | 32.0 | 64 | 33-90 |
| 95-48-7 | LCS | o-Cresol | 50.0 | 0.0 | 37.9 | 76 | 32-90 |
| 65794-96-9 | LCS | m,p-Cresols | 50.0 | 0.0 | 38.5 | 77 | 28-100 |
| 621-64-7 | LCS | N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine* | 50.0 | 0.0 | 47.8 | 96 | 39-113 |
| 67-72-1 | LCS | Hexachloroethane | 50.0 | 0.0 | 27.7 | 55 | 20-85 |
| 98-95-3 | LCS | Nitrobenzene | 50.0 | 0.0 | 47.5 | 95 | 41-119 |
| 78-59-1 | LCS | Isophorone | 50.0 | 0.0 | 52.0 | 104 | 49-133 |
| 88-75-5 | LCS | 2-Nitrophenol | 50.0 | 0.0 | 37.3 | 75 | 42-111 |
| 105-67-9 | LCS | 2,4-Dimethylphenol | 50.0 | 0.0 | 39.5 | 79 | 43-99 |
| 111-91-1 | LCS | bis(2-Chloroethoxy)methane | 50.0 | 0.0 | 48.2 | 96 | 44-109 |
| 120-83-2 | LCS | 2,4-Dichlorophenol | 50.0 | 0.0 | 38.9 | 78 | 45-106 |
| 65-85-0 | LCS | Benzoic acid | 100 | 0.0 | 25.4 | 25 | 10-81 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1387888**
**Lab Sample ID** **1203088330**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/15/2014 19:43**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-47-8 | LCS | 4-Chloroaniline | 50.0 | 0.0 | 41.5 | 83 | 50-122 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 31.2 | 62 | 19-92 |
| 59-50-7 | LCS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 50.0 | 0.0 | 44.3 | 89 | 46-111 |
| 91-57-6 | LCS | 2-Methylnaphthalene | 50.0 | 0.0 | 32.7 | 65 | 33-102 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 34.0 | 68 | 31-98 |
| 90-12-0 | LCS | 1-Methylnaphthalene | 50.0 | 0.0 | 35.3 | 71 | 35-106 |
| 77-47-4 | LCS | Hexachlorocyclopentadiene | 50.0 | 0.0 | 16.9 | 34 | 15-72 |
| 88-06-2 | LCS | 2,4,6-Trichlorophenol | 50.0 | 0.0 | 40.6 | 81 | 41-109 |
| 95-95-4 | LCS | 2,4,5-Trichlorophenol | 50.0 | 0.0 | 39.7 | 79 | 41-111 |
| 91-58-7 | LCS | 2-Chloronaphthalene | 50.0 | 0.0 | 35.1 | 70 | 36-98 |
| 88-74-4 | LCS | 2-Nitroaniline<br>*o-Nitroaniline* | 50.0 | 0.0 | 46.8 | 94 | 44-117 |
| 99-09-2 | LCS | 3-Nitroaniline<br>*m-Nitroaniline* | 50.0 | 0.0 | 42.0 | 84 | 45-124 |
| 131-11-3 | LCS | Dimethylphthalate | 50.0 | 0.0 | 48.7 | 97 | 53-112 |
| 606-20-2 | LCS | 2,6-Dinitrotoluene | 50.0 | 0.0 | 46.9 | 94 | 52-117 |
| 121-14-2 | LCS | 2,4-Dinitrotoluene | 50.0 | 0.0 | 49.7 | 99 | 45-124 |
| 208-96-8 | LCS | Acenaphthylene | 50.0 | 0.0 | 38.5 | 77 | 37-107 |
| 83-32-9 | LCS | Acenaphthene | 50.0 | 0.0 | 36.7 | 73 | 40-104 |
| 51-28-5 | LCS | 2,4-Dinitrophenol | 50.0 | 0.0 | 31.6 | 63 | 19-110 |
| 132-64-9 | LCS | Dibenzofuran | 50.0 | 0.0 | 43.3 | 87 | 45-107 |
| 58-90-2 | LCS | 2,3,4,6-Tetrachlorophenol | 50.0 | 0.0 | 41.3 | 83 | 45-120 |
| 84-66-2 | LCS | Diethylphthalate | 50.0 | 0.0 | 51.2 | 102 | 51-116 |
| 100-02-7 | LCS | 4-Nitrophenol | 50.0 | 0.0 | 12.0 | 24 | 16-77 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1387888**
**Lab Sample ID** **1203088330**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/15/2014 19:43**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 86-73-7 | LCS | Fluorene | 50.0 | 0.0 | 42.2 | 84 | 43-110 |
| 7005-72-3 | LCS | 4-Chlorophenylphenylether | 50.0 | 0.0 | 47.9 | 96 | 40-114 |
| 100-01-6 | LCS | 4-Nitroaniline<br>*p-Nitroaniline* | 50.0 | 0.0 | 52.8 | 106 | 38-133 |
| 534-52-1 | LCS | 2-Methyl-4,6-dinitrophenol | 50.0 | 0.0 | 39.2 | 78 | 34-114 |
| 122-39-4 | LCS | Diphenylamine | 50.0 | 0.0 | 40.6 | 81 | 47-111 |
| 122-66-7 | LCS | Azobenzene<br>*1,2-Diphenylhydrazine* | 50.0 | 0.0 | 42.8 | 86 | 40-112 |
| 101-55-3 | LCS | 4-Bromophenylphenylether | 50.0 | 0.0 | 45.3 | 91 | 41-113 |
| 118-74-1 | LCS | Hexachlorobenzene | 50.0 | 0.0 | 45.4 | 91 | 43-116 |
| 87-86-5 | LCS | Pentachlorophenol | 50.0 | 0.0 | 35.7 | 71 | 27-102 |
| 85-01-8 | LCS | Phenanthrene | 50.0 | 0.0 | 41.4 | 83 | 47-111 |
| 120-12-7 | LCS | Anthracene | 50.0 | 0.0 | 41.6 | 83 | 46-110 |
| 84-74-2 | LCS | Di-n-butylphthalate | 50.0 | 0.0 | 51.8 | 104 | 49-116 |
| 206-44-0 | LCS | Fluoranthene | 50.0 | 0.0 | 47.5 | 95 | 45-118 |
| 129-00-0 | LCS | Pyrene | 50.0 | 0.0 | 35.6 | 71 | 38-127 |
| 85-68-7 | LCS | Butylbenzylphthalate | 50.0 | 0.0 | 43.6 | 87 | 40-122 |
| 117-81-7 | LCS | bis(2-Ethylhexyl)phthalate | 50.0 | 0.0 | 44.6 | 89 | 37-124 |
| 56-55-3 | LCS | Benzo(a)anthracene | 50.0 | 0.0 | 40.0 | 80 | 49-111 |
| 218-01-9 | LCS | Chrysene | 50.0 | 0.0 | 40.3 | 81 | 44-117 |
| 117-84-0 | LCS | Di-n-octylphthalate | 50.0 | 0.0 | 45.8 | 92 | 33-122 |
| 205-99-2 | LCS | Benzo(b)fluoranthene | 50.0 | 0.0 | 41.2 | 82 | 47-117 |
| 207-08-9 | LCS | Benzo(k)fluoranthene | 50.0 | 0.0 | 42.0 | 84 | 46-119 |
| 50-32-8 | LCS | Benzo(a)pyrene | 50.0 | 0.0 | 40.7 | 81 | 47-110 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **LCS for batch 1387888**
**Lab Sample ID** **1203088330**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **05/15/2014 19:43**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 193-39-5 | LCS | Indeno(1,2,3-cd)pyrene | 50.0 | 0.0 | 34.2 | 68 | 37-125 |
| 53-70-3 | LCS | Dibenzo(a,h)anthracene | 50.0 | 0.0 | 35.0 | 70 | 36-125 |
| 191-24-2 | LCS | Benzo(ghi)perylene | 50.0 | 0.0 | 34.0 | 68 | 33-126 |
| 123-91-1 | LCS | 1,4-Dioxane | 50.0 | 0.0 | 29.2 | 58 | 26-73 |
| 930-55-2 | LCS | N-Nitrosopyrrolidine | 50.0 | 0.0 | 42.4 | 85 | 42-106 |
| 95-94-3 | LCS | 1,2,4,5-Tetrachlorobenzene | 50.0 | 0.0 | 31.3 | 63 | 36-95 |
| 1912-24-9 | LCS | Atrazine | 50.0 | 0.0 | 49.0 | 98 | 47-115 |
| 92-87-5 | LCS | Benzidine | 100 | 0.0 | 37.4 | 37 | 10-124 |
| 91-94-1 | LCS | 3,3'-Dichlorobenzidine | 50.0 | 0.0 | 42.3 | 85 | 31-113 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 31.2 | 62 | 26-92 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75494MS**
**Lab Sample ID** **1203088331**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **05/15/2014 22:39**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 123-91-1 | MS | 1,4-Dioxane | 109 | 8.55 | J | 90.9 | 76 | 26-88 |
| 62-75-9 | MS | N-Methyl-N-nitrosomethylam | 109 | 0.00 | U | 81.7 | 75 | 21-88 |
| 110-86-1 | MS | Pyridine | 109 | 0.00 | U | 84.6 | 78 | 14-94 |
| 62-53-3 | MS | Aniline | 109 | 0.00 | U | 103 | 95 | 24-109 |
| 108-95-2 | MS | Phenol | 109 | 0.00 | U | 63.5 | 58 | 10-88 |
| 111-44-4 | MS | bis(2-Chloroethyl) ether | 109 | 0.00 | U | 101 | 93 | 25-114 |
| 95-57-8 | MS | 2-Chlorophenol | 109 | 0.00 | U | 87.9 | 81 | 31-103 |
| 541-73-1 | MS | 1,3-Dichlorobenzene | 109 | 0.00 | U | 72.7 | 67 | 18-83 |
| 106-46-7 | MS | 1,4-Dichlorobenzene | 109 | 0.00 | U | 74.7 | 69 | 20-86 |
| 95-50-1 | MS | 1,2-Dichlorobenzene | 109 | 0.00 | U | 76.0 | 70 | 21-85 |
| 108-60-1 | MS | bis(2-Chloro-1-methylethyl)et | 109 | 0.00 | U | 106 | 98 | 16-121 |
| 100-51-6 | MS | Benzyl alcohol | 109 | 0.00 | U | 79.3 | 73 | 31-100 |
| 95-48-7 | MS | o-Cresol | 109 | 0.00 | U | 92.1 | 85 | 26-97 |
| 65794-96-9 | MS | m,p-Cresols | 109 | 0.00 | U | 101 | 93 | 24-110 |
| 621-64-7 | MS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 109 | 0.00 | U | 105 | 96 | 29-116 |
| 67-72-1 | MS | Hexachloroethane | 109 | 0.00 | U | 70.3 | 65 | 17-82 |
| 98-95-3 | MS | Nitrobenzene | 109 | 0.00 | U | 104 | 96 | 32-126 |
| 78-59-1 | MS | Isophorone | 109 | 0.00 | U | 111 | 102 | 36-139 |
| 88-75-5 | MS | 2-Nitrophenol | 109 | 0.00 | U | 87.3 | 80 | 29-117 |
| 105-67-9 | MS | 2,4-Dimethylphenol | 109 | 0.00 | U | 87.7 | 81 | 28-107 |
| 111-91-1 | MS | bis(2-Chloroethoxy)methane | 109 | 0.00 | U | 101 | 93 | 34-112 |
| 120-83-2 | MS | 2,4-Dichlorophenol | 109 | 0.00 | U | 88.3 | 81 | 34-111 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75494MS**
**Lab Sample ID** **1203088331**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **05/15/2014 22:39**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 65-85-0 | MS | Benzoic acid | 217 | 0.00 | U | 121 | 56 | 10-105 |
| 106-47-8 | MS | 4-Chloroaniline | 109 | 0.00 | U | 89.8 | 83 | 28-123 |
| 87-68-3 | MS | Hexachlorobutadiene | 109 | 0.00 | U | 77.3 | 71 | 11-97 |
| 59-50-7 | MS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 109 | 0.00 | U | 98.4 | 91 | 31-119 |
| 91-57-6 | MS | 2-Methylnaphthalene | 109 | 0.00 | U | 81.5 | 75 | 26-103 |
| 91-20-3 | MS | Naphthalene | 109 | 0.00 | U | 83.0 | 76 | 25-100 |
| 90-12-0 | MS | 1-Methylnaphthalene | 109 | 0.00 | U | 87.2 | 80 | 27-107 |
| 77-47-4 | MS | Hexachlorocyclopentadiene | 109 | 0.00 | U | 43.7 | 40 | 14-73 |
| 88-06-2 | MS | 2,4,6-Trichlorophenol | 109 | 0.00 | U | 91.4 | 84 | 31-113 |
| 95-95-4 | MS | 2,4,5-Trichlorophenol | 109 | 0.00 | U | 93.1 | 86 | 30-117 |
| 91-58-7 | MS | 2-Chloronaphthalene | 109 | 0.00 | U | 83.6 | 77 | 30-97 |
| 88-74-4 | MS | 2-Nitroaniline<br>*o-Nitroaniline* | 109 | 0.00 | U | 100 | 92 | 28-122 |
| 99-09-2 | MS | 3-Nitroaniline<br>*m-Nitroaniline* | 109 | 0.00 | U | 90.3 | 83 | 29-125 |
| 131-11-3 | MS | Dimethylphthalate | 109 | 0.00 | U | 103 | 95 | 41-116 |
| 606-20-2 | MS | 2,6-Dinitrotoluene | 109 | 0.00 | U | 99.9 | 92 | 40-123 |
| 121-14-2 | MS | 2,4-Dinitrotoluene | 109 | 0.00 | U | 106 | 97 | 34-126 |
| 208-96-8 | MS | Acenaphthylene | 109 | 0.00 | U | 87.6 | 81 | 33-104 |
| 83-32-9 | MS | Acenaphthene | 109 | 0.00 | U | 83.4 | 77 | 31-103 |
| 51-28-5 | MS | 2,4-Dinitrophenol | 109 | 0.00 | U | 62.8 | 58 | 17-110 |
| 132-64-9 | MS | Dibenzofuran | 109 | 0.00 | U | 96.4 | 89 | 36-107 |
| 58-90-2 | MS | 2,3,4,6-Tetrachlorophenol | 109 | 0.00 | U | 95.2 | 88 | 29-126 |
| 84-66-2 | MS | Diethylphthalate | 109 | 0.00 | U | 108 | 100 | 41-117 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75494MS**
**Lab Sample ID** **1203088331**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **05/15/2014 22:39**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 100-02-7 | MS | 4-Nitrophenol | 109 | 0.00 | U | 46.8 | 43 | 16-71 |
| 86-73-7 | MS | Fluorene | 109 | 0.00 | U | 91.2 | 84 | 32-111 |
| 7005-72-3 | MS | 4-Chlorophenylphenylether | 109 | 0.00 | U | 106 | 97 | 30-112 |
| 100-01-6 | MS | 4-Nitroaniline<br>*p-Nitroaniline* | 109 | 0.00 | U | 109 | 100 | 25-133 |
| 534-52-1 | MS | 2-Methyl-4,6-dinitrophenol | 109 | 0.00 | U | 84.2 | 77 | 22-118 |
| 122-39-4 | MS | Diphenylamine | 109 | 0.00 | U | 86.8 | 80 | 34-111 |
| 122-66-7 | MS | Azobenzene<br>*1,2-Diphenylhydrazine* | 109 | 0.00 | U | 92.7 | 85 | 30-112 |
| 101-55-3 | MS | 4-Bromophenylphenylether | 109 | 0.00 | U | 97.5 | 90 | 32-111 |
| 118-74-1 | MS | Hexachlorobenzene | 109 | 0.00 | U | 94.9 | 87 | 33-115 |
| 87-86-5 | MS | Pentachlorophenol | 109 | 0.00 | U | 81.7 | 75 | 19-112 |
| 85-01-8 | MS | Phenanthrene | 109 | 0.00 | U | 87.6 | 81 | 34-112 |
| 120-12-7 | MS | Anthracene | 109 | 0.00 | U | 87.6 | 81 | 33-108 |
| 84-74-2 | MS | Di-n-butylphthalate | 109 | 0.00 | U | 109 | 100 | 35-118 |
| 206-44-0 | MS | Fluoranthene | 109 | 0.00 | U | 98.2 | 90 | 31-118 |
| 129-00-0 | MS | Pyrene | 109 | 0.00 | U | 77.4 | 71 | 27-126 |
| 85-68-7 | MS | Butylbenzylphthalate | 109 | 0.00 | U | 93.1 | 86 | 29-121 |
| 117-81-7 | MS | bis(2-Ethylhexyl)phthalate | 109 | 0.00 | U | 93.1 | 86 | 29-120 |
| 56-55-3 | MS | Benzo(a)anthracene | 109 | 0.00 | U | 83.5 | 77 | 35-112 |
| 218-01-9 | MS | Chrysene | 109 | 0.00 | U | 83.6 | 77 | 32-116 |
| 117-84-0 | MS | Di-n-octylphthalate | 109 | 0.00 | U | 94.5 | 87 | 25-118 |
| 205-99-2 | MS | Benzo(b)fluoranthene | 109 | 0.00 | U | 87.9 | 81 | 34-116 |
| 207-08-9 | MS | Benzo(k)fluoranthene | 109 | 0.00 | U | 89.1 | 82 | 34-119 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75494MS**
**Lab Sample ID** **1203088331**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **05/15/2014 22:39**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 50-32-8 | MS | Benzo(a)pyrene | 109 | 0.00 | U | 85.5 | 79 | 34-110 |
| 193-39-5 | MS | Indeno(1,2,3-cd)pyrene | 109 | 0.00 | U | 73.3 | 67 | 25-122 |
| 53-70-3 | MS | Dibenzo(a,h)anthracene | 109 | 0.00 | U | 75.9 | 70 | 24-123 |
| 191-24-2 | MS | Benzo(ghi)perylene | 109 | 0.00 | U | 74.3 | 68 | 22-122 |
| 930-55-2 | MS | N-Nitrosopyrrolidine | 109 | 0.00 | U | 97.7 | 90 | 42-110 |
| 95-94-3 | MS | 1,2,4,5-Tetrachlorobenzene | 109 | 0.00 | U | 77.4 | 71 | 29-96 |
| 1912-24-9 | MS | Atrazine | 109 | 0.00 | U | 106 | 97 | 33-121 |
| 92-87-5 | MS | Benzidine | 217 | 0.00 | U | 25.0 | 11 | 10-117 |
| 91-94-1 | MS | 3,3'-Dichlorobenzidine | 109 | 0.00 | U | 85.4 | 79 | 22-111 |
| 120-82-1 | MS | 1,2,4-Trichlorobenzene | 109 | 0.00 | U | 77.7 | 71 | 20-90 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75494MSD**
**Lab Sample ID** **1203088332**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/15/2014 23:08**
**Dilution: 1**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 123-91-1 | MSD | 1,4-Dioxane | 109 | 8.55 | J | 101 | 85 | 26-88 | 10 | 0-30 |
| 62-75-9 | MSD | N-Methyl-N-nitrosomethylam | 109 | 0.00 | U | 89.8 | 83 | 21-88 | 10 | 0-30 |
| 110-86-1 | MSD | Pyridine | 109 | 0.00 | U | 95.0 | 87 | 14-94 | 12 | 0-30 |
| 62-53-3 | MSD | Aniline | 109 | 0.00 | U | 113 | 104 | 24-109 | 9 | 0-30 |
| 108-95-2 | MSD | Phenol | 109 | 0.00 | U | 70.0 | 64 | 10-88 | 10 | 0-30 |
| 111-44-4 | MSD | bis(2-Chloroethyl) ether | 109 | 0.00 | U | 109 | 101 | 25-114 | 8 | 0-30 |
| 95-57-8 | MSD | 2-Chlorophenol | 109 | 0.00 | U | 96.8 | 89 | 31-103 | 10 | 0-30 |
| 541-73-1 | MSD | 1,3-Dichlorobenzene | 109 | 0.00 | U | 78.0 | 72 | 18-83 | 7 | 0-30 |
| 106-46-7 | MSD | 1,4-Dichlorobenzene | 109 | 0.00 | U | 79.8 | 73 | 20-86 | 7 | 0-30 |
| 95-50-1 | MSD | 1,2-Dichlorobenzene | 109 | 0.00 | U | 80.2 | 74 | 21-85 | 5 | 0-30 |
| 108-60-1 | MSD | bis(2-Chloro-1-methylethyl)et | 109 | 0.00 | U | 115 | 105 | 16-121 | 8 | 0-30 |
| 100-51-6 | MSD | Benzyl alcohol | 109 | 0.00 | U | 90.2 | 83 | 31-100 | 13 | 0-30 |
| 95-48-7 | MSD | o-Cresol | 109 | 0.00 | U | 101 | 93 | 26-97 | 9 | 0-30 |
| 65794-96-9 | MSD | m,p-Cresols | 109 | 0.00 | U | 112 | 103 | 24-110 | 10 | 0-30 |
| 621-64-7 | MSD | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 109 | 0.00 | U | 113 | 104 | 29-116 | 8 | 0-30 |
| 67-72-1 | MSD | Hexachloroethane | 109 | 0.00 | U | 75.1 | 69 | 17-82 | 7 | 0-30 |
| 98-95-3 | MSD | Nitrobenzene | 109 | 0.00 | U | 114 | 105 | 32-126 | 9 | 0-30 |
| 78-59-1 | MSD | Isophorone | 109 | 0.00 | U | 122 | 112 | 36-139 | 9 | 0-30 |
| 88-75-5 | MSD | 2-Nitrophenol | 109 | 0.00 | U | 97.5 | 90 | 29-117 | 11 | 0-30 |
| 105-67-9 | MSD | 2,4-Dimethylphenol | 109 | 0.00 | U | 93.0 | 86 | 28-107 | 6 | 0-30 |
| 111-91-1 | MSD | bis(2-Chloroethoxy)methane | 109 | 0.00 | U | 112 | 103 | 34-112 | 10 | 0-30 |
| 120-83-2 | MSD | 2,4-Dichlorophenol | 109 | 0.00 | U | 97.2 | 89 | 34-111 | 10 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75494MSD**
**Lab Sample ID** **1203088332**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/15/2014 23:08**
**Dilution: 1**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 65-85-0 | MSD | Benzoic acid | 217 | 0.00 | U | 142 | 65 | 10-105 | 16 | 0-30 |
| 106-47-8 | MSD | 4-Chloroaniline | 109 | 0.00 | U | 101 | 93 | 28-123 | 12 | 0-30 |
| 87-68-3 | MSD | Hexachlorobutadiene | 109 | 0.00 | U | 80.2 | 74 | 11-97 | 4 | 0-30 |
| 59-50-7 | MSD | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 109 | 0.00 | U | 109 | 100 | 31-119 | 10 | 0-30 |
| 91-57-6 | MSD | 2-Methylnaphthalene | 109 | 0.00 | U | 86.1 | 79 | 26-103 | 5 | 0-30 |
| 91-20-3 | MSD | Naphthalene | 109 | 0.00 | U | 87.3 | 80 | 25-100 | 5 | 0-30 |
| 90-12-0 | MSD | 1-Methylnaphthalene | 109 | 0.00 | U | 92.8 | 85 | 27-107 | 6 | 0-30 |
| 77-47-4 | MSD | Hexachlorocyclopentadiene | 109 | 0.00 | U | 53.2 | 49 | 14-73 | 20 | 0-30 |
| 88-06-2 | MSD | 2,4,6-Trichlorophenol | 109 | 0.00 | U | 102 | 94 | 31-113 | 11 | 0-30 |
| 95-95-4 | MSD | 2,4,5-Trichlorophenol | 109 | 0.00 | U | 104 | 95 | 30-117 | 11 | 0-30 |
| 91-58-7 | MSD | 2-Chloronaphthalene | 109 | 0.00 | U | 91.2 | 84 | 30-97 | 9 | 0-30 |
| 88-74-4 | MSD | 2-Nitroaniline<br>*o-Nitroaniline* | 109 | 0.00 | U | 114 | 105 | 28-122 | 13 | 0-30 |
| 99-09-2 | MSD | 3-Nitroaniline<br>*m-Nitroaniline* | 109 | 0.00 | U | 103 | 95 | 29-125 | 13 | 0-30 |
| 131-11-3 | MSD | Dimethylphthalate | 109 | 0.00 | U | 114 | 105 | 41-116 | 9 | 0-30 |
| 606-20-2 | MSD | 2,6-Dinitrotoluene | 109 | 0.00 | U | 111 | 102 | 40-123 | 11 | 0-30 |
| 121-14-2 | MSD | 2,4-Dinitrotoluene | 109 | 0.00 | U | 120 | 110 | 34-126 | 12 | 0-30 |
| 208-96-8 | MSD | Acenaphthylene | 109 | 0.00 | U | 96.0 | 88 | 33-104 | 9 | 0-30 |
| 83-32-9 | MSD | Acenaphthene | 109 | 0.00 | U | 90.4 | 83 | 31-103 | 8 | 0-30 |
| 51-28-5 | MSD | 2,4-Dinitrophenol | 109 | 0.00 | U | 81.9 | 75 | 17-110 | 26 | 0-30 |
| 132-64-9 | MSD | Dibenzofuran | 109 | 0.00 | U | 107 | 99 | 36-107 | 11 | 0-30 |
| 58-90-2 | MSD | 2,3,4,6-Tetrachlorophenol | 109 | 0.00 | U | 107 | 99 | 29-126 | 12 | 0-30 |
| 84-66-2 | MSD | Diethylphthalate | 109 | 0.00 | U | 119 | 109 | 41-117 | 9 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75494MSD**
**Lab Sample ID** **1203088332**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/15/2014 23:08**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 100-02-7 | MSD | 4-Nitrophenol | 109 | 0.00 | U | 51.9 | 48 | 16-71 | 10 | 0-30 |
| 86-73-7 | MSD | Fluorene | 109 | 0.00 | U | 102 | 94 | 32-111 | 11 | 0-30 |
| 7005-72-3 | MSD | 4-Chlorophenylphenylether | 109 | 0.00 | U | 116 | 107 | 30-112 | 10 | 0-30 |
| 100-01-6 | MSD | 4-Nitroaniline<br>*p-Nitroaniline* | 109 | 0.00 | U | 127 | 117 | 25-133 | 16 | 0-30 |
| 534-52-1 | MSD | 2-Methyl-4,6-dinitrophenol | 109 | 0.00 | U | 97.5 | 90 | 22-118 | 15 | 0-30 |
| 122-39-4 | MSD | Diphenylamine | 109 | 0.00 | U | 94.4 | 87 | 34-111 | 8 | 0-30 |
| 122-66-7 | MSD | Azobenzene<br>*1,2-Diphenylhydrazine* | 109 | 0.00 | U | 101 | 93 | 30-112 | 8 | 0-30 |
| 101-55-3 | MSD | 4-Bromophenylphenylether | 109 | 0.00 | U | 107 | 99 | 32-111 | 9 | 0-30 |
| 118-74-1 | MSD | Hexachlorobenzene | 109 | 0.00 | U | 103 | 95 | 33-115 | 8 | 0-30 |
| 87-86-5 | MSD | Pentachlorophenol | 109 | 0.00 | U | 91.6 | 84 | 19-112 | 11 | 0-30 |
| 85-01-8 | MSD | Phenanthrene | 109 | 0.00 | U | 95.7 | 88 | 34-112 | 9 | 0-30 |
| 120-12-7 | MSD | Anthracene | 109 | 0.00 | U | 97.0 | 89 | 33-108 | 10 | 0-30 |
| 84-74-2 | MSD | Di-n-butylphthalate | 109 | 0.00 | U | 118 | 108 | 35-118 | 8 | 0-30 |
| 206-44-0 | MSD | Fluoranthene | 109 | 0.00 | U | 108 | 99 | 31-118 | 9 | 0-30 |
| 129-00-0 | MSD | Pyrene | 109 | 0.00 | U | 86.1 | 79 | 27-126 | 11 | 0-30 |
| 85-68-7 | MSD | Butylbenzylphthalate | 109 | 0.00 | U | 104 | 95 | 29-121 | 11 | 0-30 |
| 117-81-7 | MSD | bis(2-Ethylhexyl)phthalate | 109 | 0.00 | U | 103 | 95 | 29-120 | 10 | 0-30 |
| 56-55-3 | MSD | Benzo(a)anthracene | 109 | 0.00 | U | 92.5 | 85 | 35-112 | 10 | 0-30 |
| 218-01-9 | MSD | Chrysene | 109 | 0.00 | U | 92.8 | 85 | 32-116 | 10 | 0-30 |
| 117-84-0 | MSD | Di-n-octylphthalate | 109 | 0.00 | U | 103 | 95 | 25-118 | 9 | 0-30 |
| 205-99-2 | MSD | Benzo(b)fluoranthene | 109 | 0.00 | U | 100 | 92 | 34-116 | 13 | 0-30 |
| 207-08-9 | MSD | Benzo(k)fluoranthene | 109 | 0.00 | U | 102 | 93 | 34-119 | 13 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-3375**
**Client ID:** **CAMO-14-75494MSD**
**Lab Sample ID** **1203088332**
**Instrument:** **MSD2.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **05/15/2014 23:08**
**Prep Batch ID:** **1387888**
**Batch ID:** **1387889**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 50-32-8 | MSD | Benzo(a)pyrene | 109 | 0.00 | U | 96.0 | 88 | 34-110 | 12 | 0-30 |
| 193-39-5 | MSD | Indeno(1,2,3-cd)pyrene | 109 | 0.00 | U | 78.1 | 72 | 25-122 | 6 | 0-30 |
| 53-70-3 | MSD | Dibenzo(a,h)anthracene | 109 | 0.00 | U | 81.0 | 74 | 24-123 | 6 | 0-30 |
| 191-24-2 | MSD | Benzo(ghi)perylene | 109 | 0.00 | U | 77.9 | 72 | 22-122 | 5 | 0-30 |
| 930-55-2 | MSD | N-Nitrosopyrrolidine | 109 | 0.00 | U | 108 | 100 | 42-110 | 11 | 0-30 |
| 95-94-3 | MSD | 1,2,4,5-Tetrachlorobenzene | 109 | 0.00 | U | 83.7 | 77 | 29-96 | 8 | 0-30 |
| 1912-24-9 | MSD | Atrazine | 109 | 0.00 | U | 112 | 103 | 33-121 | 6 | 0-30 |
| 92-87-5 | MSD | Benzidine | 217 | 0.00 | U | 61.0 | 28 | 10-117 | 84 * | 0-30 |
| 91-94-1 | MSD | 3,3'-Dichlorobenzidine | 109 | 0.00 | U | 94.7 | 87 | 22-111 | 10 | 0-30 |
| 120-82-1 | MSD | 1,2,4-Trichlorobenzene | 109 | 0.00 | U | 81.2 | 75 | 20-90 | 4 | 0-30 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1387888** | **Instrument ID:** | **MSD2.I** | **Data File:** | **s051514.B\s2e1511.D** |
| **Lab Sample ID:** | **1203088329** | **Prep Date:** | **05/15/2014 10:13** | **Analyzed:** | **05/15/14 20:12** |
| **Column:** | **DB-5ms** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1387888 | 1203088330 | s051514.B\s2e1510.D | 05/15/14 | 1943 |
| 02 CAMO-14-75545 | 348530003 | s051514.B\s2e1514.D | 05/15/14 | 2142 |
| 03 CAMO-14-75494MS | 1203088331 | s051514.B\s2e1516.D | 05/15/14 | 2239 |
| 04 CAMO-14-75494MSD | 1203088332 | s051514.B\s2e1517.D | 05/15/14 | 2308 |

# Quality Control Data

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203088329** | | | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1387888** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 20:12** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1511.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 90-12-0 | 1-Methylnaphthalene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-57-6 | 2-Methylnaphthalene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 83-32-9 | Acenaphthene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 208-96-8 | Acenaphthylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 120-12-7 | Anthracene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 56-55-3 | Benzo(a)anthracene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 50-32-8 | Benzo(a)pyrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 205-99-2 | Benzo(b)fluoranthene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 191-24-2 | Benzo(ghi)perylene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203088329** | | | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1387888** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 20:12** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1511.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 218-01-9 | Chrysene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 206-44-0 | Fluoranthene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 86-73-7 | Fluorene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 118-74-1 | Hexachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-86-5 | Pentachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-01-8 | Phenanthrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 129-00-0 | Pyrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203088329** | | | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1387888** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 20:12** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1511.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 78.4 | 100 | ug/L | 78.4 | (26%-129%) |
| 2-Fluorobiphenyl | 32.7 | 50.0 | ug/L | 65.5 | (32%-102%) |
| 2-Fluorophenol | 50.3 | 100 | ug/L | 50.3 | (10%-78%) |
| Nitrobenzene-d5 | 41.6 | 50.0 | ug/L | 83.1 | (36%-125%) |
| Phenol-d5 | 32.7 | 100 | ug/L | 32.7 | (10%-104%) |
| p-Terphenyl-d14 | 43.2 | 50.0 | ug/L | 86.5 | (34%-135%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203088330** | | | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1387888** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 19:43** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 31.3 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 31.2 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 31.4 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | | 42.8 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 30.2 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 31.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | | 29.2 | ug/L | 3.00 | 10.0 |
| 90-12-0 | 1-Methylnaphthalene | | 35.3 | ug/L | 0.300 | 1.00 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 41.3 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 39.7 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 40.6 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 38.9 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 39.5 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 31.6 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 49.7 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 46.9 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | | 35.1 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | | 38.3 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 39.2 | ug/L | 3.00 | 10.0 |
| 91-57-6 | 2-Methylnaphthalene | | 32.7 | ug/L | 0.300 | 1.00 |
| 88-75-5 | 2-Nitrophenol | | 37.3 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 42.3 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 45.3 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | | 44.3 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 41.5 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 47.9 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | | 12.0 | ug/L | 3.00 | 10.0 |
| 83-32-9 | Acenaphthene | | 36.7 | ug/L | 0.300 | 1.00 |
| 208-96-8 | Acenaphthylene | | 38.5 | ug/L | 0.300 | 1.00 |
| 62-53-3 | Aniline | | 45.2 | ug/L | 4.20 | 10.0 |
| 120-12-7 | Anthracene | | 41.6 | ug/L | 0.300 | 1.00 |
| 1912-24-9 | Atrazine | | 49.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | | 37.4 | ug/L | 3.90 | 10.0 |
| 56-55-3 | Benzo(a)anthracene | | 40.0 | ug/L | 0.300 | 1.00 |
| 50-32-8 | Benzo(a)pyrene | | 40.7 | ug/L | 0.300 | 1.00 |
| 205-99-2 | Benzo(b)fluoranthene | | 41.2 | ug/L | 0.300 | 1.00 |
| 191-24-2 | Benzo(ghi)perylene | | 34.0 | ug/L | 0.300 | 1.00 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203088330** | | | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1387888** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 19:43** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | | 42.0 | ug/L | 0.300 | 1.00 |
| 65-85-0 | Benzoic acid | | 25.4 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | | 32.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | | 43.6 | ug/L | 3.00 | 10.0 |
| 218-01-9 | Chrysene | | 40.3 | ug/L | 0.300 | 1.00 |
| 84-74-2 | Di-n-butylphthalate | | 51.8 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | | 45.8 | ug/L | 3.00 | 10.0 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 35.0 | ug/L | 0.300 | 1.00 |
| 132-64-9 | Dibenzofuran | | 43.3 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | | 51.2 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | | 48.7 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-39-4 | Diphenylamine | | 40.6 | ug/L | 3.00 | 10.0 |
| 206-44-0 | Fluoranthene | | 47.5 | ug/L | 0.300 | 1.00 |
| 86-73-7 | Fluorene | | 42.2 | ug/L | 0.300 | 1.00 |
| 118-74-1 | Hexachlorobenzene | | 45.4 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | | 31.2 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 16.9 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | | 27.7 | ug/L | 3.00 | 10.0 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 34.2 | ug/L | 0.300 | 1.00 |
| 78-59-1 | Isophorone | | 52.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 28.3 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 47.8 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 42.4 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 34.0 | ug/L | 0.300 | 1.00 |
| 98-95-3 | Nitrobenzene | | 47.5 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-86-5 | Pentachlorophenol | | 35.7 | ug/L | 3.00 | 10.0 |
| 85-01-8 | Phenanthrene | | 41.4 | ug/L | 0.300 | 1.00 |
| 108-95-2 | Phenol | | 17.0 | ug/L | 3.00 | 10.0 |
| 129-00-0 | Pyrene | | 35.6 | ug/L | 0.300 | 1.00 |
| 110-86-1 | Pyridine | | 33.1 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 47.8 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 48.2 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 46.4 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 44.6 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203088330** | | | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1387888** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 19:43** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1510.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | | 38.5 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 42.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | | 37.9 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 46.8 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 52.8 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 88.4 | 100 | ug/L | 88.4 | (26%-129%) |
| 2-Fluorobiphenyl | 37.3 | 50.0 | ug/L | 74.7 | (32%-102%) |
| 2-Fluorophenol | 49.2 | 100 | ug/L | 49.2 | (10%-78%) |
| Nitrobenzene-d5 | 42.7 | 50.0 | ug/L | 85.4 | (36%-125%) |
| Phenol-d5 | 32.3 | 100 | ug/L | 32.3 | (10%-104%) |
| p-Terphenyl-d14 | 37.5 | 50.0 | ug/L | 75.1 | (34%-135%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/12/2014 11:54** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203088331** | **Date Received:** | **05/14/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75494MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 22:39** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **460 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1516.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 77.4 | ug/L | 6.52 | 21.7 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 77.7 | ug/L | 6.52 | 21.7 |
| 95-50-1 | 1,2-Dichlorobenzene | | 76.0 | ug/L | 6.52 | 21.7 |
| 122-66-7 | Azobenzene | | 92.7 | ug/L | 6.52 | 21.7 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 72.7 | ug/L | 6.52 | 21.7 |
| 106-46-7 | 1,4-Dichlorobenzene | | 74.7 | ug/L | 6.52 | 21.7 |
| 123-91-1 | 1,4-Dioxane | | 90.9 | ug/L | 6.52 | 21.7 |
| 90-12-0 | 1-Methylnaphthalene | | 87.2 | ug/L | 0.652 | 2.17 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 95.2 | ug/L | 6.52 | 21.7 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 93.1 | ug/L | 6.52 | 21.7 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 91.4 | ug/L | 6.52 | 21.7 |
| 120-83-2 | 2,4-Dichlorophenol | | 88.3 | ug/L | 6.52 | 21.7 |
| 105-67-9 | 2,4-Dimethylphenol | | 87.7 | ug/L | 6.52 | 21.7 |
| 51-28-5 | 2,4-Dinitrophenol | | 62.8 | ug/L | 10.9 | 43.5 |
| 121-14-2 | 2,4-Dinitrotoluene | | 106 | ug/L | 6.52 | 21.7 |
| 606-20-2 | 2,6-Dinitrotoluene | | 99.9 | ug/L | 6.52 | 21.7 |
| 91-58-7 | 2-Chloronaphthalene | | 83.6 | ug/L | 0.891 | 2.17 |
| 95-57-8 | 2-Chlorophenol | | 87.9 | ug/L | 6.52 | 21.7 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 84.2 | ug/L | 6.52 | 21.7 |
| 91-57-6 | 2-Methylnaphthalene | | 81.5 | ug/L | 0.652 | 2.17 |
| 88-75-5 | 2-Nitrophenol | | 87.3 | ug/L | 6.52 | 21.7 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 85.4 | ug/L | 6.52 | 21.7 |
| 101-55-3 | 4-Bromophenylphenylether | | 97.5 | ug/L | 6.52 | 21.7 |
| 59-50-7 | Parachlorometa cresol | | 98.4 | ug/L | 6.52 | 21.7 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 89.8 | ug/L | 7.17 | 21.7 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 106 | ug/L | 6.52 | 21.7 |
| 100-02-7 | 4-Nitrophenol | | 46.8 | ug/L | 6.52 | 21.7 |
| 83-32-9 | Acenaphthene | | 83.4 | ug/L | 0.652 | 2.17 |
| 208-96-8 | Acenaphthylene | | 87.6 | ug/L | 0.652 | 2.17 |
| 62-53-3 | Aniline | | 103 | ug/L | 9.13 | 21.7 |
| 120-12-7 | Anthracene | | 87.6 | ug/L | 0.652 | 2.17 |
| 1912-24-9 | Atrazine | | 106 | ug/L | 6.52 | 21.7 |
| 92-87-5 | Benzidine | | 25.0 | ug/L | 8.48 | 21.7 |
| 56-55-3 | Benzo(a)anthracene | | 83.5 | ug/L | 0.652 | 2.17 |
| 50-32-8 | Benzo(a)pyrene | | 85.5 | ug/L | 0.652 | 2.17 |
| 205-99-2 | Benzo(b)fluoranthene | | 87.9 | ug/L | 0.652 | 2.17 |
| 191-24-2 | Benzo(ghi)perylene | | 74.3 | ug/L | 0.652 | 2.17 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/12/2014 11:54** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203088331** | **Date Received:** | **05/14/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75494MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 22:39** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **460 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1516.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | | 89.1 | ug/L | 0.652 | 2.17 |
| 65-85-0 | Benzoic acid | | 121 | ug/L | 13.0 | 43.5 |
| 100-51-6 | Benzyl alcohol | | 79.3 | ug/L | 6.52 | 21.7 |
| 85-68-7 | Butylbenzylphthalate | | 93.1 | ug/L | 6.52 | 21.7 |
| 218-01-9 | Chrysene | | 83.6 | ug/L | 0.652 | 2.17 |
| 84-74-2 | Di-n-butylphthalate | | 109 | ug/L | 6.52 | 21.7 |
| 117-84-0 | Di-n-octylphthalate | | 94.5 | ug/L | 6.52 | 21.7 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 75.9 | ug/L | 0.652 | 2.17 |
| 132-64-9 | Dibenzofuran | | 96.4 | ug/L | 6.52 | 21.7 |
| 84-66-2 | Diethylphthalate | | 108 | ug/L | 6.52 | 21.7 |
| 131-11-3 | Dimethylphthalate | | 103 | ug/L | 6.52 | 21.7 |
| 88-85-7 | Dinoseb | U | 21.7 | ug/L | 6.52 | 21.7 |
| 122-39-4 | Diphenylamine | | 86.8 | ug/L | 6.52 | 21.7 |
| 206-44-0 | Fluoranthene | | 98.2 | ug/L | 0.652 | 2.17 |
| 86-73-7 | Fluorene | | 91.2 | ug/L | 0.652 | 2.17 |
| 118-74-1 | Hexachlorobenzene | | 94.9 | ug/L | 6.52 | 21.7 |
| 87-68-3 | Hexachlorobutadiene | | 77.3 | ug/L | 6.52 | 21.7 |
| 77-47-4 | Hexachlorocyclopentadiene | | 43.7 | ug/L | 6.52 | 21.7 |
| 67-72-1 | Hexachloroethane | | 70.3 | ug/L | 6.52 | 21.7 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 73.3 | ug/L | 0.652 | 2.17 |
| 78-59-1 | Isophorone | | 111 | ug/L | 7.61 | 21.7 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 81.7 | ug/L | 6.52 | 21.7 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 21.7 | ug/L | 6.52 | 21.7 |
| 55-18-5 | N-Nitrosodiethylamine | U | 21.7 | ug/L | 6.52 | 21.7 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 105 | ug/L | 6.52 | 21.7 |
| 930-55-2 | N-Nitrosopyrrolidine | | 97.7 | ug/L | 6.52 | 21.7 |
| 91-20-3 | Naphthalene | | 83.0 | ug/L | 0.652 | 2.17 |
| 98-95-3 | Nitrobenzene | | 104 | ug/L | 6.52 | 21.7 |
| 608-93-5 | Pentachlorobenzene | U | 21.7 | ug/L | 6.52 | 21.7 |
| 87-86-5 | Pentachlorophenol | | 81.7 | ug/L | 6.52 | 21.7 |
| 85-01-8 | Phenanthrene | | 87.6 | ug/L | 0.652 | 2.17 |
| 108-95-2 | Phenol | | 63.5 | ug/L | 6.52 | 21.7 |
| 129-00-0 | Pyrene | | 77.4 | ug/L | 0.652 | 2.17 |
| 110-86-1 | Pyridine | | 84.6 | ug/L | 6.52 | 21.7 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 106 | ug/L | 6.52 | 21.7 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 101 | ug/L | 6.52 | 21.7 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 101 | ug/L | 6.52 | 21.7 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 93.1 | ug/L | 6.52 | 21.7 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/12/2014 11:54** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203088331** | **Date Received:** | **05/14/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75494MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 22:39** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **460 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1516.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | | 101 | ug/L | 8.04 | 21.7 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 90.3 | ug/L | 6.52 | 21.7 |
| 95-48-7 | o-Cresol | | 92.1 | ug/L | 6.52 | 21.7 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 100 | ug/L | 6.52 | 21.7 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 109 | ug/L | 6.52 | 21.7 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 193 | 217 | ug/L | 88.8 | (26%-129%) |
| 2-Fluorobiphenyl | 86.6 | 109 | ug/L | 79.7 | (32%-102%) |
| 2-Fluorophenol | 148 | 217 | ug/L | 68.1 | (10%-78%) |
| Nitrobenzene-d5 | 93.3 | 109 | ug/L | 85.9 | (36%-125%) |
| Phenol-d5 | 121 | 217 | ug/L | 55.6 | (10%-104%) |
| p-Terphenyl-d14 | 79.9 | 109 | ug/L | 73.5 | (34%-135%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/12/2014 11:54** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203088332** | **Date Received:** | **05/14/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75494MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 23:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **460 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1517.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 83.7 | ug/L | 6.52 | 21.7 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 81.2 | ug/L | 6.52 | 21.7 |
| 95-50-1 | 1,2-Dichlorobenzene | | 80.2 | ug/L | 6.52 | 21.7 |
| 122-66-7 | Azobenzene | | 101 | ug/L | 6.52 | 21.7 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 78.0 | ug/L | 6.52 | 21.7 |
| 106-46-7 | 1,4-Dichlorobenzene | | 79.8 | ug/L | 6.52 | 21.7 |
| 123-91-1 | 1,4-Dioxane | | 101 | ug/L | 6.52 | 21.7 |
| 90-12-0 | 1-Methylnaphthalene | | 92.8 | ug/L | 0.652 | 2.17 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 107 | ug/L | 6.52 | 21.7 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 104 | ug/L | 6.52 | 21.7 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 102 | ug/L | 6.52 | 21.7 |
| 120-83-2 | 2,4-Dichlorophenol | | 97.2 | ug/L | 6.52 | 21.7 |
| 105-67-9 | 2,4-Dimethylphenol | | 93.0 | ug/L | 6.52 | 21.7 |
| 51-28-5 | 2,4-Dinitrophenol | | 81.9 | ug/L | 10.9 | 43.5 |
| 121-14-2 | 2,4-Dinitrotoluene | | 120 | ug/L | 6.52 | 21.7 |
| 606-20-2 | 2,6-Dinitrotoluene | | 111 | ug/L | 6.52 | 21.7 |
| 91-58-7 | 2-Chloronaphthalene | | 91.2 | ug/L | 0.891 | 2.17 |
| 95-57-8 | 2-Chlorophenol | | 96.8 | ug/L | 6.52 | 21.7 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 97.5 | ug/L | 6.52 | 21.7 |
| 91-57-6 | 2-Methylnaphthalene | | 86.1 | ug/L | 0.652 | 2.17 |
| 88-75-5 | 2-Nitrophenol | | 97.5 | ug/L | 6.52 | 21.7 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 94.7 | ug/L | 6.52 | 21.7 |
| 101-55-3 | 4-Bromophenylphenylether | | 107 | ug/L | 6.52 | 21.7 |
| 59-50-7 | Parachlorometa cresol | | 109 | ug/L | 6.52 | 21.7 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 101 | ug/L | 7.17 | 21.7 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 116 | ug/L | 6.52 | 21.7 |
| 100-02-7 | 4-Nitrophenol | | 51.9 | ug/L | 6.52 | 21.7 |
| 83-32-9 | Acenaphthene | | 90.4 | ug/L | 0.652 | 2.17 |
| 208-96-8 | Acenaphthylene | | 96.0 | ug/L | 0.652 | 2.17 |
| 62-53-3 | Aniline | | 113 | ug/L | 9.13 | 21.7 |
| 120-12-7 | Anthracene | | 97.0 | ug/L | 0.652 | 2.17 |
| 1912-24-9 | Atrazine | | 112 | ug/L | 6.52 | 21.7 |
| 92-87-5 | Benzidine | | 61.0 | ug/L | 8.48 | 21.7 |
| 56-55-3 | Benzo(a)anthracene | | 92.5 | ug/L | 0.652 | 2.17 |
| 50-32-8 | Benzo(a)pyrene | | 96.0 | ug/L | 0.652 | 2.17 |
| 205-99-2 | Benzo(b)fluoranthene | | 100 | ug/L | 0.652 | 2.17 |
| 191-24-2 | Benzo(ghi)perylene | | 77.9 | ug/L | 0.652 | 2.17 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/12/2014 11:54** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203088332** | **Date Received:** | **05/14/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75494MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 23:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **460 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1517.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | | 102 | ug/L | 0.652 | 2.17 |
| 65-85-0 | Benzoic acid | | 142 | ug/L | 13.0 | 43.5 |
| 100-51-6 | Benzyl alcohol | | 90.2 | ug/L | 6.52 | 21.7 |
| 85-68-7 | Butylbenzylphthalate | | 104 | ug/L | 6.52 | 21.7 |
| 218-01-9 | Chrysene | | 92.8 | ug/L | 0.652 | 2.17 |
| 84-74-2 | Di-n-butylphthalate | | 118 | ug/L | 6.52 | 21.7 |
| 117-84-0 | Di-n-octylphthalate | | 103 | ug/L | 6.52 | 21.7 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 81.0 | ug/L | 0.652 | 2.17 |
| 132-64-9 | Dibenzofuran | | 107 | ug/L | 6.52 | 21.7 |
| 84-66-2 | Diethylphthalate | | 119 | ug/L | 6.52 | 21.7 |
| 131-11-3 | Dimethylphthalate | | 114 | ug/L | 6.52 | 21.7 |
| 88-85-7 | Dinoseb | U | 21.7 | ug/L | 6.52 | 21.7 |
| 122-39-4 | Diphenylamine | | 94.4 | ug/L | 6.52 | 21.7 |
| 206-44-0 | Fluoranthene | | 108 | ug/L | 0.652 | 2.17 |
| 86-73-7 | Fluorene | | 102 | ug/L | 0.652 | 2.17 |
| 118-74-1 | Hexachlorobenzene | | 103 | ug/L | 6.52 | 21.7 |
| 87-68-3 | Hexachlorobutadiene | | 80.2 | ug/L | 6.52 | 21.7 |
| 77-47-4 | Hexachlorocyclopentadiene | | 53.2 | ug/L | 6.52 | 21.7 |
| 67-72-1 | Hexachloroethane | | 75.1 | ug/L | 6.52 | 21.7 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 78.1 | ug/L | 0.652 | 2.17 |
| 78-59-1 | Isophorone | | 122 | ug/L | 7.61 | 21.7 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 89.8 | ug/L | 6.52 | 21.7 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 21.7 | ug/L | 6.52 | 21.7 |
| 55-18-5 | N-Nitrosodiethylamine | U | 21.7 | ug/L | 6.52 | 21.7 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 113 | ug/L | 6.52 | 21.7 |
| 930-55-2 | N-Nitrosopyrrolidine | | 108 | ug/L | 6.52 | 21.7 |
| 91-20-3 | Naphthalene | | 87.3 | ug/L | 0.652 | 2.17 |
| 98-95-3 | Nitrobenzene | | 114 | ug/L | 6.52 | 21.7 |
| 608-93-5 | Pentachlorobenzene | U | 21.7 | ug/L | 6.52 | 21.7 |
| 87-86-5 | Pentachlorophenol | | 91.6 | ug/L | 6.52 | 21.7 |
| 85-01-8 | Phenanthrene | | 95.7 | ug/L | 0.652 | 2.17 |
| 108-95-2 | Phenol | | 70.0 | ug/L | 6.52 | 21.7 |
| 129-00-0 | Pyrene | | 86.1 | ug/L | 0.652 | 2.17 |
| 110-86-1 | Pyridine | | 95.0 | ug/L | 6.52 | 21.7 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 115 | ug/L | 6.52 | 21.7 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 112 | ug/L | 6.52 | 21.7 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 109 | ug/L | 6.52 | 21.7 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 103 | ug/L | 6.52 | 21.7 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-3375** | **Date Collected:** | **05/12/2014 11:54** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203088332** | **Date Received:** | **05/14/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1387888** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAMO-14-75494MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1387889** | **Inst:** | **MSD2.I** | **Dilution:** | **1** |
| **Run Date:** | **05/15/2014 23:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **05/15/2014 10:13** | **Aliquot:** | **460 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s051514.B\s2e1517.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | | 112 | ug/L | 8.04 | 21.7 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 103 | ug/L | 6.52 | 21.7 |
| 95-48-7 | o-Cresol | | 101 | ug/L | 6.52 | 21.7 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 114 | ug/L | 6.52 | 21.7 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 127 | ug/L | 6.52 | 21.7 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 216 | 217 | ug/L | 99.3 | (26%-129%) |
| 2-Fluorobiphenyl | 93.8 | 109 | ug/L | 86.3 | (32%-102%) |
| 2-Fluorophenol | 161 | 217 | ug/L | 74.1 | (10%-78%) |
| Nitrobenzene-d5 | 102 | 109 | ug/L | 94.2 | (36%-125%) |
| Phenol-d5 | 132 | 217 | ug/L | 60.7 | (10%-104%) |
| p-Terphenyl-d14 | 89.2 | 109 | ug/L | 82.0 | (34%-135%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 16-MAY-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| SEMIVOA GC/MS | SW846 3510C/8270D | Liquid | ARSL (ESHL) |
| **Batch ID:** | **Sample Numbers:** | | |
| 1387889 | See Below | | |

**Potentially affected work order(s)(SDG): 348526(2014-3373),348530(2014-3375),348630(2014-3383)**

**Application Issues:**

Failed RPD for MS/MSD, or PS/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The RPD between the MS(1203088331) and the MSD(1203088332) did not meet the 0% to 30% acceptance limits for Benzidine at 83.8%. | 1. The RPD failure is attributed to the large difference in the recovery values between analyte pair in the MS and MSD. The individual LCS, MS and MSD recoveries for this analyte were within their established acceptance criteria. The data are reported unqualified for the RPD value failure. |

**Originator's Name:**

Anne Salter 16-MAY-14

**Data Validator/Group Leader:**

Herbert Maier 16-MAY-14

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International, LLC (ARSL)**
**SDG 2014-3375**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1388153 |
| Prep Batch Number: | 1388152 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203088982 | Interference Check Sample (ICS) |
| 1203088978 | Method Blank (MB) |
| 1203088979 | Laboratory Control Sample (LCS) |
| 1203088980 | 348527004(CASA-14-75538) Matrix Spike (MS) |
| 1203088981 | 348527004(CASA-14-75538) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
The initial calibration verification standard (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 348527004 (CASA-14-75538) from SDG 2014-3374 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Chromatographic Columns

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3375  GEL Work Order: 348530

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 27 MAY 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1388152

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-75548

**Date Received:** 13-MAY-14

**GEL Job No (SDG):** 2014-3375

**GEL Sample ID:** 348530002

**Date Filtered:** 15-MAY-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.320 | ug/L | | 1 | 20-MAY-14 19:56 | per0520049a |
| | Perchlorate Isotope Ratio | | | 3 | | | 1 | 20-MAY-14 19:56 | per0520049a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.318 | ug/L | | 1 | 20-MAY-14 19:56 | per0520049a |
| | Perchlorate-O(18) | | | 0.477 | ug/L | | 1 | 20-MAY-14 19:56 | per0520049a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1388152

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-75549

**Date Received:** 13-MAY-14

**GEL Job No (SDG):** 2014-3375

**GEL Sample ID:** 348530004

**Date Filtered:** 15-MAY-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.293 | ug/L | | 1 | 20-MAY-14 20:05 | per0520050a |
| | Perchlorate Isotope Ratio | | | 2.89 | | | 1 | 20-MAY-14 20:05 | per0520050a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.302 | ug/L | | 1 | 20-MAY-14 20:05 | per0520050a |
| | Perchlorate-O(18) | | | 0.475 | ug/L | | 1 | 20-MAY-14 20:05 | per0520050a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2014-3375

**Extract Batch Code:** 1388152

**Date Filtered:** 15-MAY-14

**Matrix:** WATER

**Sample ID:** 1203088979

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .181 | ug/L | 90.6 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.03 | | | | - |
| Perchlorate-101 | 0.200 | .178 | ug/L | 89.0 | | 85 - 115 |
| Perchlorate-O(18) | | .485 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2014-3375

**Extract Batch Code:** 1388152

**Date Extracted:** 15-MAY-14

**GEL MS/PS ID:** 1203088980

**Client ID:** CASA-14-75538

**GEL MSD/PSD ID:** 1203088981

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.613 | ug/L | 0.815 | 101 | .788 | 87.5 | 3.37 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 2.92 | | 3.05 | | 2.9 | | 5.04 | | - |
| Perchlorate-101 | 0.200 | 0.625 | ug/L | 0.795 | 84.9 | .809 | 91.6 | 1.67 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.486 | ug/L | 0.495 | | .464 | | 6.48 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1388152

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 15-MAY-14

**GEL Job No (SDG):** 2014-3375

**GEL Sample ID:** 1203088978

**Date Filtered:** 15-MAY-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 20-MAY-14 18:57 | per0520042a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 20-MAY-14 18:57 | per0520042a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 20-MAY-14 18:57 | per0520042a |
| | Perchlorate-O(18) | | | 0.489 | ug/L | | 1 | 20-MAY-14 18:57 | per0520042a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1388152

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 15-MAY-14

**GEL Job No (SDG):** 2014-3375

**GEL Sample ID:** 1203088979

**Date Filtered:** 15-MAY-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.181 | ug/L | J | 1 | 20-MAY-14 19:05 | per0520043a |
| | Perchlorate Isotope Ratio | | | 3.03 | | | 1 | 20-MAY-14 19:05 | per0520043a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.178 | ug/L | J | 1 | 20-MAY-14 19:05 | per0520043a |
| | Perchlorate-O(18) | | | 0.485 | ug/L | | 1 | 20-MAY-14 19:05 | per0520043a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1388152

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2014-3375

**GEL Sample ID:** 1203088982

**Date Filtered:** 15-MAY-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.188 | ug/L | J | 1 | 20-MAY-14 19:14 | per0520044a |
| | Perchlorate Isotope Ratio | | | 3.05 | | | 1 | 20-MAY-14 19:14 | per0520044a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.184 | ug/L | J | 1 | 20-MAY-14 19:14 | per0520044a |
| | Perchlorate-O(18) | | | 0.469 | ug/L | | 1 | 20-MAY-14 19:14 | per0520044a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1388152

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CASA-14-75538MS

**Date Received:** 13-MAY-14

**GEL Job No (SDG):** 2014-3375

**GEL Sample ID:** 1203088980

**Date Filtered:** 15-MAY-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.815 | ug/L | | 1 | 20-MAY-14 19:39 | per0520047a |
| | Perchlorate Isotope Ratio | | | 3.05 | | | 1 | 20-MAY-14 19:39 | per0520047a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.795 | ug/L | | 1 | 20-MAY-14 19:39 | per0520047a |
| | Perchlorate-O(18) | | | 0.495 | ug/L | | 1 | 20-MAY-14 19:39 | per0520047a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1388152

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CASA-14-75538MSD

**Date Received:** 13-MAY-14

**GEL Job No (SDG):** 2014-3375

**GEL Sample ID:** 1203088981

**Date Filtered:** 15-MAY-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.788 | ug/L | | 1 | 20-MAY-14 19:48 | per0520048a |
| | Perchlorate Isotope Ratio | | | 2.9 | | | 1 | 20-MAY-14 19:48 | per0520048a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.809 | ug/L | | 1 | 20-MAY-14 19:48 | per0520048a |
| | Perchlorate-O(18) | | | 0.464 | ug/L | | 1 | 20-MAY-14 19:48 | per0520048a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3375**

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 348530001 | CAMO-14-75544 |
| 348530002 | CAMO-14-75548 |
| 348530003 | CAMO-14-75545 |
| 348530004 | CAMO-14-75549 |
| 1203088025 | Method Blank (MB) **ICP** |
| 1203088026 | Laboratory Control Sample (LCS) |
| 1203088030 | 348532001(CAMO-14-75863L) Serial Dilution (SD) |
| 1203088027 | 348532001(CAMO-14-75863D) Sample Duplicate (DUP) |
| 1203088028 | 348532001(CAMO-14-75863S) Matrix Spike (MS) |
| 1203088029 | 348532001(CAMO-14-75863SD) Matrix Spike Duplicate (MSD) |
| 1203088105 | Method Blank (MB) **ICP-MS** |
| 1203088106 | Laboratory Control Sample (LCS) |
| 1203088109 | 348532001(CAMO-14-75863L) Serial Dilution (SD) |
| 1203088107 | 348532001(CAMO-14-75863D) Sample Duplicate (DUP) |
| 1203088108 | 348532001(CAMO-14-75863S) Matrix Spike (MS) |
| 1203097981 | Method Blank (MB) **CVAA** |
| 1203097982 | Laboratory Control Sample (LCS) |
| 1203097985 | 348532001(CAMO-14-75863L) Serial Dilution (SD) |
| 1203097983 | 348532001(CAMO-14-75863D) Sample Duplicate (DUP) |
| 1203097984 | 348532001(CAMO-14-75863S) Matrix Spike (MS) |

## Method/Analysis Information

| | |
|---|---|
| **Analytical Batch:** | 1387760, 1387803, 1391688 and 1392496 |
| **Prep Batch :** | 1387759, 1387802 and 1391687 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 10, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 27 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**
The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## System Configuration

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

## Calibration Information

**Instrument Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL/PQL Requirements**
The PQL standard recoveries for SW846 6010C met the control limits except for potassium and sodium in file 052914-1 at 1353 and 20:32. Potassium recovered high in the initial and closing PQL standards, however the analyte concentrations in the associated client samples were greater than two times the PQL. Sodium recovered high in the closing PQL standard; however the analyte concentrations in the associated client samples were greater than two times the PQL. Therefore, the data were not considered adversely affected.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blanks (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 348532001 (CAMO-14-75863)-ICP, ICP-MS and CVAA.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable elements met the acceptance criteria.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable elements met the acceptance criteria.

**MS/MSD Relative Percent Difference (RPD) Statement**
The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD between qualifying elements results in the MS and MSD were within the acceptance limits of 20%.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

## Technical Information

### Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

### Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

### Sample Dilutions
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples 348530002 (CAMO-14-75548) and 348530004 (CAMO-14-75549)-ICP were diluted for tin to minimize suppression due to matrix interferences.

### Preparation Information
The samples in this SDG were prepared exactly according to the cited SOP.

## Miscellaneous Information

### Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports are included in the Miscellaneous Data section of the package. A data exception report was not required for this SDG.

### Additional Comments
Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:** Pat Stull **Date:** 06/06/2014

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3375  GEL Work Order: 348530

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by Pat Steele 06/06/2014

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3375 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

**SAMPLE ID:** 348530001 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75544 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 05/30/14 10:23 | 053014W1−6 | 1391688 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1391688 | 1391687 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 05/29/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3375 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

**SAMPLE ID:** 348530002 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75548 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 05/30/14 10:25 | 053014W1−6 | 1391688 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−3375 **CONTRACT:** ESHL00114 **METHOD TYPE:** SW846

**SAMPLE ID:** 348530002 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75548 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−38−2 | Arsenic | 6.74 | ug/L | | 1.7 | 5 | 5 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−39−3 | Barium | 24.4 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−42−8 | Boron | 16.4 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−70−2 | Calcium | 16000 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−47−3 | Chromium | 4.67 | ug/L | J | 2 | 10 | 10 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7439−95−4 | Magnesium | 3690 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 05/30/14 18:16 | 053014−2 | 1387760 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7439−98−7 | Molybdenum | 1.13 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−02−0 | Nickel | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−09−7 | Potassium | 1730 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7631−86−9 | Silica | 68000 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−23−5 | Sodium | 10700 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−24−6 | Strontium | 56.8 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−31−5 | Tin | 50 | ug/L | U | 12.5 | 50 | 50 | 5 | P | HSC | 05/31/14 07:54 | 053114A−3 | 1387760 |
| 7440−61−1 | Uranium | 0.484 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | PRB | 05/30/14 23:48 | 140530−5 | 1387803 |
| 7440−62−2 | Vanadium | 6.61 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 05/29/14 20:00 | 052914−1 | 1387760 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3375 **CONTRACT:** ESHL00114 **METHOD TYPE:**

**SAMPLE ID:** 348530002 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75548 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 55.2 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 06/02/14 09:04 | | 1392496 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1387760 | 1387759 | SW846 3005A | 50 | mL | 50 | mL | 05/22/14 | KXP3 |
| 1387803 | 1387802 | SW846 3005A | 50 | mL | 50 | mL | 05/22/14 | KXP3 |
| 1391688 | 1391687 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 05/29/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3375 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

**SAMPLE ID:** 348530003 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75545 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 05/30/14 10:30 | 053014W1−6 | 1391688 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1391688 | 1391687 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 05/29/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3375 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

**SAMPLE ID:** 348530004 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75549 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | NOR1 | 05/30/14 10:32 | 053014W1−6 | 1391688 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−3375 **CONTRACT:** ESHL00114 **METHOD TYPE:** SW846

**SAMPLE ID:** 348530004 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75549 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−38−2 | Arsenic | 5.44 | ug/L | | 1.7 | 5 | 5 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−39−3 | Barium | 97.2 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−42−8 | Boron | 16.3 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−70−2 | Calcium | 53600 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−47−3 | Chromium | 923 | ug/L | | 2 | 10 | 10 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7439−95−4 | Magnesium | 15100 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 05/30/14 18:26 | 053014−2 | 1387760 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7439−98−7 | Molybdenum | 0.628 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−02−0 | Nickel | 24.5 | ug/L | | 0.5 | 2 | 2 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−09−7 | Potassium | 2370 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7631−86−9 | Silica | 73500 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−23−5 | Sodium | 17400 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−24−6 | Strontium | 201 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−31−5 | Tin | 100 | ug/L | U | 25 | 100 | 100 | 10 | P | HSC | 05/31/14 08:03 | 053114A−3 | 1387760 |
| 7440−61−1 | Uranium | 1.04 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | PRB | 05/30/14 23:56 | 140530−5 | 1387803 |
| 7440−62−2 | Vanadium | 4.97 | ug/L | J | 1 | 5 | 5 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 05/29/14 20:04 | 052914−1 | 1387760 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−3375 **CONTRACT:** ESHL00114 **METHOD TYPE:**

**SAMPLE ID:** 348530004 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75549 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 196 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 06/02/14 09:04 | | 1392496 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1387760 | 1387759 | SW846 3005A | 50 | mL | 50 | mL | 05/22/14 | KXP3 |
| 1387803 | 1387802 | SW846 3005A | 50 | mL | 50 | mL | 05/22/14 | KXP3 |
| 1391688 | 1391687 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 05/29/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2014−3375

**Contract:** ESHL00114

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203088025 | | | | | | | | |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 97.1 | ug/L | +/−150 | J | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 100 | ug/L | +/−300 | U | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| 1203088105 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203097981 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3375 **Client ID** CAMO−14−75863S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 348532001 **Spike ID:** 1203088028

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 5190 | | 68 | U | 5000 | 104 | | P |
| Barium | ug/L | 75−125 | 529 | | 22.3 | | 500 | 101 | | P |
| Beryllium | ug/L | 75−125 | 514 | | 1 | U | 500 | 103 | | P |
| Boron | ug/L | 75−125 | 507 | | 15 | U | 500 | 99.6 | | P |
| Calcium | ug/L | 75−125 | 15600 | | 10600 | | 5000 | 99.4 | | P |
| Cobalt | ug/L | 75−125 | 498 | | 1 | U | 500 | 99.5 | | P |
| Copper | ug/L | 75−125 | 532 | | 3 | U | 500 | 106 | | P |
| Iron | ug/L | 75−125 | 5300 | | 30 | U | 5000 | 106 | | P |
| Magnesium | ug/L | 75−125 | 8820 | | 3480 | | 5000 | 107 | | P |
| Manganese | ug/L | 75−125 | 519 | | 2 | U | 500 | 103 | | P |
| Potassium | ug/L | 75−125 | 6950 | | 1930 | | 5000 | 100 | | P |
| Silica | ug/L | | 83200 | | 73100 | | 10700 | 94.1 | N/A | P |
| Sodium | ug/L | 75−125 | 15500 | | 9840 | | 5000 | 114 | | P |
| Strontium | ug/L | 75−125 | 573 | | 44.1 | | 500 | 106 | | P |
| Tin | ug/L | 75−125 | 479 | | 12.5 | U | 500 | 95.7 | | P |
| Vanadium | ug/L | 75−125 | 535 | | 7.05 | | 500 | 106 | | P |
| Zinc | ug/L | 75−125 | 513 | | 4.09 | J | 500 | 102 | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Duplicate Summary**

**SDG NO.** 2014−3375 **Client ID** CAMO−14−75863SD

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 348532001 **Spike ID:** 1203088029

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 5150 | | 68 | U | 5000 | 103 | | P |
| Barium | ug/L | 75−125 | 529 | | 22.3 | | 500 | 101 | | P |
| Beryllium | ug/L | 75−125 | 513 | | 1 | U | 500 | 103 | | P |
| Boron | ug/L | 75−125 | 506 | | 15 | U | 500 | 99.4 | | P |
| Calcium | ug/L | 75−125 | 15500 | | 10600 | | 5000 | 97.9 | | P |
| Cobalt | ug/L | 75−125 | 494 | | 1 | U | 500 | 98.8 | | P |
| Copper | ug/L | 75−125 | 529 | | 3 | U | 500 | 106 | | P |
| Iron | ug/L | 75−125 | 5270 | | 30 | U | 5000 | 105 | | P |
| Magnesium | ug/L | 75−125 | 8740 | | 3480 | | 5000 | 105 | | P |
| Manganese | ug/L | 75−125 | 516 | | 2 | U | 500 | 103 | | P |
| Potassium | ug/L | 75−125 | 6910 | | 1930 | | 5000 | 99.5 | | P |
| Silica | ug/L | | 82900 | | 73100 | | 10700 | 91.9 | N/A | P |
| Sodium | ug/L | 75−125 | 15200 | | 9840 | | 5000 | 108 | | P |
| Strontium | ug/L | 75−125 | 568 | | 44.1 | | 500 | 105 | | P |
| Tin | ug/L | 75−125 | 494 | | 12.5 | U | 500 | 98.9 | | P |
| Vanadium | ug/L | 75−125 | 532 | | 7.05 | | 500 | 105 | | P |
| Zinc | ug/L | 75−125 | 510 | | 4.09 | J | 500 | 101 | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3375 **Client ID** CAMO−14−75863S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 348532001 **Spike ID:** 1203088108

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | 75−125 | 55.4 | | 5.41 | | 50 | 100 | | MS |
| Arsenic | ug/L | 75−125 | 50.5 | | 1.7 | U | 50 | 100 | | MS |
| Cadmium | ug/L | 75−125 | 50.6 | | 0.11 | U | 50 | 101 | | MS |
| Chromium | ug/L | 75−125 | 55.4 | | 5.84 | J | 50 | 99 | | MS |
| Lead | ug/L | 75−125 | 49 | | 0.5 | U | 50 | 98 | | MS |
| Molybdenum | ug/L | 75−125 | 49.4 | | 0.972 | | 50 | 96.9 | | MS |
| Nickel | ug/L | 75−125 | 48.6 | | 0.649 | J | 50 | 95.9 | | MS |
| Selenium | ug/L | 75−125 | 48.4 | | 1.5 | U | 50 | 95.3 | | MS |
| Silver | ug/L | 75−125 | 50.8 | | 0.2 | U | 50 | 102 | | MS |
| Thallium | ug/L | 75−125 | 42.8 | | 0.45 | U | 50 | 85.4 | | MS |
| Uranium | ug/L | 75−125 | 50.7 | | 0.448 | | 50 | 100 | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3375 **Client ID** CAMO−14−75863S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 348532001 **Spike ID:** 1203097984

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 1.87 | | 0.067 | U | 2 | 93.7 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3375 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** CAMO−14−75863D

**Matrix:** WATER **Level:** Low

**Sample ID:** 348532001 **Duplicate ID:** 1203088027 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−5 | 22.3 | | 21.9 | | 1.81 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | | 15 | U | 15 | U | | | P |
| Calcium | ug/L | +/−20% | 10600 | | 10300 | | 3.4 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−20% | 3480 | | 3390 | | 2.42 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 1930 | | 1850 | | 4.32 | | P |
| Silica | ug/L | +/−20% | 73100 | | 71400 | | 2.41 | | P |
| Sodium | ug/L | +/−20% | 9840 | | 9480 | | 3.72 | | P |
| Strontium | ug/L | +/−20% | 44.1 | | 42.6 | | 3.56 | | P |
| Tin | ug/L | | 12.5 | U | 12.5 | U | | | P |
| Vanadium | ug/L | +/−5 | 7.05 | | 7.64 | | 8.09 | | P |
| Zinc | ug/L | +/−10 | 4.09 | J | 3.37 | J | 19.4 | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3375 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** CAMO−14−75863SD

**Matrix:** WATER **Level:** Low

**Sample ID:** 1203088028 **Duplicate ID:** 1203088029 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | +/−20 | 5190 | | 5150 | | .681 | | P |
| Barium | ug/L | +/−20 | 529 | | 529 | | .14 | | P |
| Beryllium | ug/L | +/−20 | 514 | | 513 | | .24 | | P |
| Boron | ug/L | +/−20 | 507 | | 506 | | .156 | | P |
| Calcium | ug/L | +/−20 | 15600 | | 15500 | | .47 | | P |
| Cobalt | ug/L | +/−20 | 498 | | 494 | | .799 | | P |
| Copper | ug/L | +/−20 | 532 | | 529 | | .557 | | P |
| Iron | ug/L | +/−20 | 5300 | | 5270 | | .55 | | P |
| Magnesium | ug/L | +/−20 | 8820 | | 8740 | | .915 | | P |
| Manganese | ug/L | +/−20 | 519 | | 516 | | .547 | | P |
| Potassium | ug/L | +/−20 | 6950 | | 6910 | | .606 | | P |
| Silica | ug/L | +/−20 | 83200 | | 82900 | | .285 | | P |
| Sodium | ug/L | +/−20 | 15500 | | 15200 | | 1.97 | | P |
| Strontium | ug/L | +/−20 | 573 | | 568 | | .844 | | P |
| Tin | ug/L | +/−20 | 479 | | 494 | | 3.25 | | P |
| Vanadium | ug/L | +/−20 | 535 | | 532 | | .581 | | P |
| Zinc | ug/L | +/−20 | 513 | | 510 | | .602 | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3375 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** CAMO−14−75863D

**Matrix:** WATER **Level:** Low

**Sample ID:** 348532001 **Duplicate ID:** 1203088107 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | +/−3 | 5.41 | | 5.13 | | 5.24 | | MS |
| Arsenic | ug/L | | 1.7 | U | 1.7 | U | | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | +/−10 | 5.84 | J | 6.44 | J | 9.75 | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 0.972 | | 0.938 | | 3.56 | | MS |
| Nickel | ug/L | +/−2 | 0.649 | J | 0.574 | J | 12.3 | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−.2 | 0.448 | | 0.423 | | 5.74 | | MS |

***Analytical Methods:**

**MS SW846 3005A/6020A**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3375 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** CAMO−14−75863D

**Matrix:** WATER **Level:** Low

**Sample ID:** 348532001 **Duplicate ID:** 1203097983 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3375

**Contract:** ESHL00114

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203088026 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 5380 | | 108 | 80−120 | P |
| | Barium | ug/L | 500 | 521 | | 104 | 80−120 | P |
| | Beryllium | ug/L | 500 | 519 | | 104 | 80−120 | P |
| | Boron | ug/L | 500 | 503 | | 101 | 80−120 | P |
| | Calcium | ug/L | 5000 | 5330 | | 107 | 80−120 | P |
| | Cobalt | ug/L | 500 | 507 | | 101 | 80−120 | P |
| | Copper | ug/L | 500 | 529 | | 106 | 80−120 | P |
| | Iron | ug/L | 5000 | 5370 | | 107 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 5480 | | 110 | 80−120 | P |
| | Manganese | ug/L | 500 | 531 | | 106 | 80−120 | P |
| | Potassium | ug/L | 5000 | 5310 | | 106 | 80−120 | P |
| | Silica | ug/L | 10700 | 10700 | | 100 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5540 | | 111 | 80−120 | P |
| | Strontium | ug/L | 500 | 542 | | 108 | 80−120 | P |
| | Tin | ug/L | 500 | 512 | | 102 | 80−120 | P |
| | Vanadium | ug/L | 500 | 538 | | 108 | 80−120 | P |
| | Zinc | ug/L | 500 | 518 | | 104 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3375

**Contract:** ESHL00114

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203088106 | | | | | | | | |
| | Antimony | ug/L | 50 | 50.3 | | 101 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 48 | | 96.1 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 51.5 | | 103 | 80−120 | MS |
| | Chromium | ug/L | 50 | 50.2 | | 100 | 80−120 | MS |
| | Lead | ug/L | 50 | 50 | | 100 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 49.4 | | 98.8 | 80−120 | MS |
| | Nickel | ug/L | 50 | 49.7 | | 99.4 | 80−120 | MS |
| | Selenium | ug/L | 50 | 47.6 | | 95.1 | 80−120 | MS |
| | Silver | ug/L | 50 | 51.4 | | 103 | 80−120 | MS |
| | Thallium | ug/L | 50 | 44.4 | | 88.8 | 80−120 | MS |
| | Uranium | ug/L | 50 | 52 | | 104 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3375

**Contract:** ESHL00114

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203097982 | | | | | | | | |
| | Mercury | ug/L | 2 | 1.97 | | 98.5 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3375 **Client ID** CAMO−14−75863L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 348532001 **Serial Dilution ID:** 1203088030

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 22.3 | | 23.2 | J | 3.97 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 15 | U | 75 | U | | | | P |
| Calcium | 10600 | | 10400 | | 1.86 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 3480 | | 3430 | | 1.27 | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 1930 | | 2020 | | 4.9 | | | P |
| Silica | 73100 | | 72400 | | 1.01 | | 10 | P |
| Sodium | 9840 | | 10200 | | 3.53 | | 10 | P |
| Strontium | 44.1 | | 45.6 | | 3.35 | | | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 7.05 | | 5.87 | J | 16.7 | | | P |
| Zinc | 4.09 | J | 16.5 | U | 100 | | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3375 **Client ID** CAMO−14−75863L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 348532001 **Serial Dilution ID:** 1203088109

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 5.41 | | 5.41 | J | .019 | | | MS |
| Arsenic | 1.7 | U | 8.5 | U | | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 5.84 | J | 10 | U | 100 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | .972 | | 1.38 | J | 42 | | | MS |
| Nickel | .649 | J | 2.5 | U | 100 | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | .448 | | .41 | J | 8.48 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3375 **Client ID** CAMO−14−75863L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 348532001 **Serial Dilution ID:** 1203097985

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3375**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1387445 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 348530001 | CAMO-14-75544 |
| 348530003 | CAMO-14-75545 |
| 1203087252 | Method Blank (MB) |
| 1203087253 | 347885001(CASA-14-75528) Sample Duplicate (DUP) |
| 1203087254 | 348392001(CASA-14-75526) Sample Duplicate (DUP) |
| 1203087255 | 347885001(CASA-14-75528) Post Spike (PS) |
| 1203087256 | 348392001(CASA-14-75526) Post Spike (PS) |
| 1203087257 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 347885001 (CASA-14-75528) and 348392001 (CASA-14-75526).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
A 15 mg/L Total Inorganic Carbon check standard is analyzed with each analytical run to prove that the instrument is effectively sparging away the inorganic carbon.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1391989 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203098766 | 348527002(CASA-14-75532) Sample Duplicate (DUP) |
| 1203098768 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Conductivity analysis was performed on a Orion 160 Conductivity Meter.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 348527002 (CASA-14-75532).

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1390573 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203095299 | Laboratory Control Sample (LCS) |
| 1203095300 | 348686002(CAMO-14-75550) Sample Duplicate (DUP) |
| 1203095301 | Continuing Calibration Variable (CCV) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Electrode analysis was performed on a Thermo Orion Star A111. Immediates

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

## Quality Control (QC) Information

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 348686002 (CAMO-14-75550).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
The following samples from this sample group were received by the lab outside of the method specified holding time: 348530002 (CAMO-14-75548) and 348530004 (CAMO-14-75549).

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1296873. 348530002 (CAMO-14-75548) and 348530004 (CAMO-14-75549).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1387858 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1387857 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 348530001 | CAMO-14-75544 |
| 348530003 | CAMO-14-75545 |
| 1203088224 | Method Blank (MB) |
| 1203088225 | 348526001(WSTMO-14-75608) Sample Duplicate (DUP) |
| 1203088227 | 348526001(WSTMO-14-75608) Matrix Spike (MS) |
| 1203088229 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 348526001 (WSTMO-14-75608).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203088227 (WSTMO-14-75608).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1293244 1203088227 (WSTMO-14-75608).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will

always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Ion Chromatography**

**Analytical Batch:** 1387241 **Method:** EPA 300.0 Anions Liquid 28 day

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203086676 | Method Blank (MB) |
| 1203086677 | 348392002(CASA-14-75534) Sample Duplicate (DUP) |
| 1203086678 | 348392002(CASA-14-75534) Post Spike (PS) |
| 1203086679 | Laboratory Control Sample (LCS) |
| 1203088764 | 348686002(CAMO-14-75550) Sample Duplicate (DUP) |
| 1203088765 | 348686002(CAMO-14-75550) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 22.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 348392002 (CASA-14-75534) and 348686002 (CAMO-14-75550).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203086677 (CASA-14-75534).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203086677 (CASA-14-75534), 1203086678 (CASA-14-75534), 1203088764 (CAMO-14-75550), 1203088765 (CAMO-14-75550), 348530002 (CAMO-14-75548) and 348530004 (CAMO-14-75549).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1387647 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1387646 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203087750 | Method Blank (MB) |
| 1203087752 | 348527002(CASA-14-75532) Sample Duplicate (DUP) |
| 1203087754 | 348527002(CASA-14-75532) Matrix Spike (MS) |
| 1203087755 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 348527002 (CASA-14-75532).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203087752 (CASA-14-75532).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1294754 1203087752 (CASA-14-75532).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1387649 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1387648 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 348530001 | CAMO-14-75544 |
| 348530003 | CAMO-14-75545 |
| 1203087756 | Method Blank (MB) |
| 1203087758 | 348391001(CAMO-14-75502) Sample Duplicate (DUP) |
| 1203087760 | 348391001(CAMO-14-75502) Matrix Spike (MS) |
| 1203087761 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 348391001 (CAMO-14-75502).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203087758 (CAMO-14-75502).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203087756 (MB).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1387667 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203087801 | Method Blank (MB) |
| 1203087805 | 348391002(CAMO-14-75517) Sample Duplicate (DUP) |
| 1203087809 | 348391002(CAMO-14-75517) Post Spike (PS) |
| 1203087810 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 348391002 (CAMO-14-75517).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203087805 (CAMO-14-75517) and 1203087809 (CAMO-14-75517).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1386914 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1386913 | **Method:** | EEPA 365.4 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203085712 | Method Blank (MB) |
| 1203085715 | 348391002(CAMO-14-75517) Sample Duplicate (DUP) |
| 1203085718 | 348391002(CAMO-14-75517) Matrix Spike (MS) |
| 1203085719 | Laboratory Control Sample (LCS) |
| 1203087746 | 348533001(NP160-14-74443) Sample Duplicate (DUP) |
| 1203087747 | 348533001(NP160-14-74443) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 348391002 (CAMO-14-75517) and 348533001 (NP160-14-74443).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203085715 (CAMO-14-75517).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following samples were re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported. 1203087746 (NP160-14-74443), 1203087747 (NP160-14-74443), 348530002 (CAMO-14-75548) and 348530004 (CAMO-14-75549).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1387730 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203087964 | Method Blank (MB) |
| 1203087965 | 348532001(CAMO-14-75863) Sample Duplicate (DUP) |
| 1203087967 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 348532001 (CAMO-14-75863).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1390102 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 348530002 | CAMO-14-75548 |
| 348530004 | CAMO-14-75549 |
| 1203094009 | Laboratory Control Sample (LCS) |
| 1203094010 | 348686002(CAMO-14-75550) Sample Duplicate (DUP) |
| 1203094011 | 348686002(CAMO-14-75550) Matrix Spike (MS) |
| 1203094012 | Method Blank (MB) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 348686002 (CAMO-14-75550).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____09Jun14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3375  GEL Work Order: 348530

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

H  Analytical holding time was exceeded

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 5, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2014-3375

Client Sample ID: CAMO-14-75544
Sample ID: 348530001
Matrix: W
Collect Date: 09-MAY-14 12:41
Receive Date: 13-MAY-14
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | J | 0.524 | 0.330 | 1.00 | mg/L | 1 | TSM | 05/15/14 | 2207 | 1387445 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 05/15/14 | 0906 | 1387858 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1 | KLP1 | 05/20/14 | 1019 | 1387649 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 05/14/14 | 1308 | 1387857 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 05/19/14 | 1700 | 1387648 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 5, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2014-3375

Client Sample ID: CAMO-14-75548
Sample ID: 348530002
Matrix: W
Collect Date: 09-MAY-14 12:41
Receive Date: 13-MAY-14
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conductivity Analysis | | | | | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 153 | 1.00 | 1.00 | umhos/cm | 1 | PXO1 | 05/30/14 | 1340 | 1391989 | 1 |
| Electrode Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 14.5C | H | 8.16 | 0.010 | 0.100 | SU | 1 | PXO1 | 05/23/14 | 1634 | 1390573 | 2 |
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | 1 | DM | 05/31/14 | 0704 | 1387241 | 3 |
| Chloride | | 2.72 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.329 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 2.73 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | J | 0.0358 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 05/19/14 | 1547 | 1387647 | 4 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.471 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 05/19/14 | 1356 | 1387667 | 5 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 05/15/14 | 1012 | 1386914 | 6 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 131 | 3.40 | 14.3 | mg/L | | LYG1 | 05/14/14 | 0838 | 1387730 | 7 |
| Titration Analysis | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 71.6 | 0.725 | 1.00 | mg/L | | LXA1 | 05/22/14 | 1208 | 1390102 | 8 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | AXH3 | 05/19/14 | 1520 | 1387646 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 05/14/14 | 1600 | 1386913 |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 5, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2014-3375 |
| Project: | LANL- WQH Water Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAMO-14-75548 | Project: | ESHL00114 |
| Sample ID: | 348530002 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 120.1 | |
| 2 | EPA 150.1 | |
| 3 | EPA 300.0 | |
| 4 | EPA 350.1 | |
| 5 | EPA 353.2 | |
| 6 | EPA 365.4 | |
| 7 | EPA 160.1 | |
| 8 | EPA 310.1 | |

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 5, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2014-3375

Client Sample ID: CAMO-14-75545
Sample ID: 348530003
Matrix: W
Collect Date: 09-MAY-14 11:20
Receive Date: 13-MAY-14
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 1.73 | 0.330 | 1.00 | mg/L | 1 | TSM | 05/15/14 | 2241 | 1387445 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 05/15/14 | 0911 | 1387858 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1 | KLP1 | 05/20/14 | 1020 | 1387649 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 05/14/14 | 1308 | 1387857 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 05/19/14 | 1700 | 1387648 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 5, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2014-3375

Client Sample ID: CAMO-14-75549
Sample ID: 348530004
Matrix: W
Collect Date: 09-MAY-14 11:20
Receive Date: 13-MAY-14
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conductivity Analysis | | | | | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 120 | 1.00 | 1.00 | umhos/cm | 1 | PXO1 | 05/30/14 | 1342 | 1391989 | 1 |
| Electrode Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 15.3C | H | 7.71 | 0.010 | 0.100 | SU | 1 | PXO1 | 05/23/14 | 1636 | 1390573 | 2 |
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | J | 0.0794 | 0.067 | 0.200 | mg/L | 1 | DM | 05/31/14 | 0734 | 1387241 | 3 |
| Chloride | | 1.77 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.117 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 1.78 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | J | 0.0285 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 05/19/14 | 1547 | 1387647 | 4 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.548 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 05/19/14 | 1358 | 1387667 | 5 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 05/15/14 | 1013 | 1386914 | 6 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 119 | 3.40 | 14.3 | mg/L | | LYG1 | 05/14/14 | 0838 | 1387730 | 7 |
| Titration Analysis | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 57.8 | 0.725 | 1.00 | mg/L | | LXA1 | 05/22/14 | 1215 | 1390102 | 8 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | AXH3 | 05/19/14 | 1520 | 1387646 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 05/14/14 | 1600 | 1386913 |

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: June 5, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2014-3375 |
| Project: | LANL- WQH Water Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAMO-14-75549 | Project: | ESHL00114 |
| Sample ID: | 348530004 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 120.1 | |
| 2 | EPA 150.1 | |
| 3 | EPA 300.0 | |
| 4 | EPA 350.1 | |
| 5 | EPA 353.2 | |
| 6 | EPA 365.4 | |
| 7 | EPA 160.1 | |
| 8 | EPA 310.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

**Report Date: June 5, 2014**



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **348530**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | | |
| Batch 1387445 | | | | | | | | | | | | |
| QC1203087253 347885001 DUP | | | | | | | | | | | | |
| Total Organic Carbon Average | | J | 0.683 | J | 0.637 | mg/L | 6.97 | ^ | | (+/-1.00) | TSM | 05/15/14 15:16 |
| QC1203087254 348392001 DUP | | | | | | | | | | | | |
| Total Organic Carbon Average | | J | 0.520 | J | 0.613 | mg/L | 16.4 | ^ | | (+/-1.00) | | 05/15/14 20:32 |
| QC1203087257 LCS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 10.1 | mg/L | | | 101 | (85%-115%) | | 05/15/14 14:34 |
| QC1203087252 MB | | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | | 05/15/14 14:25 |
| QC1203087255 347885001 PS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | J | 0.683 | | 11.1 | mg/L | | | 105 | (65%-120%) | | 05/15/14 15:36 |
| QC1203087256 348392001 PS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | J | 0.520 | | 10.6 | mg/L | | | 101 | (65%-120%) | | 05/15/14 20:52 |
| **Conductivity Analysis** | | | | | | | | | | | | |
| Batch 1391989 | | | | | | | | | | | | |
| QC1203098766 348527002 DUP | | | | | | | | | | | | |
| Conductivity | | | 228 | | 229 | umhos/cm | 0.438 | | | (0%-10%) | PXO1 | 05/30/14 13:35 |
| QC1203098768 LCS | | | | | | | | | | | | |
| Conductivity | 1410 | | | | 1390 | umhos/cm | | | 98.3 | (95%-105%) | | 05/30/14 13:32 |
| **Electrode Analysis** | | | | | | | | | | | | |
| Batch 1390573 | | | | | | | | | | | | |
| QC1203095300 348686002 DUP | | | | | | | | | | | | |
| pH | | H | 8.08 | H | 8.16 | SU | 0.985 | | | (0%-10%) | PXO1 | 05/23/14 16:59 |
| QC1203095299 LCS | | | | | | | | | | | | |
| pH | 7.00 | | | | 7.02 | SU | | | 100 | (99%-101%) | | 05/23/14 16:28 |
| **Flow Injection Analysis** | | | | | | | | | | | | |
| Batch 1387858 | | | | | | | | | | | | |
| QC1203088225 348526001 DUP | | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | | AXH3 | 05/15/14 09:02 |
| QC1203088229 LCS | | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 54.6 | ug/L | | | 109 | (90%-110%) | | 05/15/14 08:58 |
| QC1203088224 MB | | | | | | | | | | | | |

## QC Summary

**Workorder:** **348530**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Flow Injection Analysis** | | | | | | | | | | | |
| Batch 1387858 | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | 05/15/14 08:57 |
| QC1203088227 348526001 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 85.5 | ug/L | | 84.2* | (90%-110%) | AXH3 | 05/15/14 09:03 |
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1387241 | | | | | | | | | | | |
| QC1203086677 348392002 DUP | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | DM | 05/31/14 03:35 |
| Chloride | | | 3.00 | | 2.97 | mg/L | 0.700 | | (0%-20%) | | |
| Fluoride | | | 0.459 | | 0.444 | mg/L | 3.41 ^ | | (+/-0.100) | | |
| Sulfate | | | 3.54 | | 3.65 | mg/L | 3.00 | | (0%-20%) | | |
| QC1203088764 348686002 DUP | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | | 05/31/14 19:02 |
| Chloride | | | 1.92 | | 1.91 | mg/L | 0.355 | | (0%-20%) | | |
| Fluoride | | | 0.110 | | 0.117 | mg/L | 6.54 ^ | | (+/-0.100) | | |
| Sulfate | | | 2.05 | | 2.04 | mg/L | 0.699 | | (0%-20%) | | |
| QC1203086679 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.27 | mg/L | | 101 | (90%-110%) | | 05/31/14 01:36 |
| Chloride | 5.00 | | | | 4.96 | mg/L | | 99.2 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.51 | mg/L | | 100 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 10.0 | mg/L | | 100 | (90%-110%) | | |
| QC1203086676 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 05/31/14 01:06 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203086678 348392002 PS | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.31 | mg/L | | 99.4 | (90%-110%) | | 05/31/14 04:05 |

## QC Summary

**Workorder:** **348530**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1387241 | | | | | | | | | | | |
| Chloride | 5.00 | | 3.00 | | 8.22 | mg/L | | 105 | (90%-110%) | | |
| Fluoride | 2.50 | | 0.459 | | 2.96 | mg/L | | 100 | (90%-110%) | DM | 05/31/14 04:05 |
| Sulfate | 10.0 | | 3.54 | | 13.8 | mg/L | | 102 | (90%-110%) | | |
| QC1203088765 348686002 PS | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.27 | mg/L | | 97.8 | (90%-110%) | | 05/31/14 19:31 |
| Chloride | 5.00 | | 1.92 | | 7.03 | mg/L | | 102 | (90%-110%) | | |
| Fluoride | 2.50 | | 0.110 | | 2.55 | mg/L | | 97.7 | (90%-110%) | | |
| Sulfate | 10.0 | | 2.05 | | 12.1 | mg/L | | 101 | (90%-110%) | | |
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1386914 | | | | | | | | | | | |
| QC1203085715 348391002 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | J | 0.0273 | J | 0.0176 | mg/L | 43.2 ^ | | (+/-0.050) | KLP1 | 05/15/14 09:27 |
| QC1203087746 348533001 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | | 0.0654 | | 0.0637 | mg/L | 2.63 ^ | | (+/-0.050) | | 05/15/14 10:16 |
| QC1203085719 LCS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 1.05 | mg/L | | 105 | (79%-126%) | | 05/15/14 09:13 |
| QC1203085712 MB | | | | | | | | | | | |
| Phosphorus, Total as P | | | | U | ND | mg/L | | | | | 05/15/14 09:12 |
| QC1203085718 348391002 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | J | 0.0273 | | 1.14 | mg/L | | 111 | (64%-134%) | | 05/15/14 09:28 |
| QC1203087747 348533001 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | 0.0654 | | 1.17 | mg/L | | 110 | (64%-134%) | | 05/15/14 10:16 |
| Batch 1387647 | | | | | | | | | | | |
| QC1203087752 348527002 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | | 0.0753 | U | ND | mg/L | 182*^ | | (+/-0.050) | KLP1 | 05/19/14 15:44 |
| QC1203087755 LCS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 1.03 | mg/L | | 103 | (90%-110%) | | 05/19/14 15:33 |
| QC1203087750 MB | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | U | ND | mg/L | | | | | 05/19/14 15:32 |
| QC1203087754 348527002 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | 0.0753 | | 1.04 | mg/L | | 96.5 | (90%-110%) | | 05/19/14 15:45 |

## QC Summary

**Workorder:** **348530**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1387647 | | | | | | | | | | | |
| Batch 1387649 | | | | | | | | | | | |
| QC1203087758 348391001 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | | KLP1 | 05/20/14 10:14 |
| QC1203087761 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 1.04 | mg/L | | 104 | (90%-110%) | | 05/20/14 10:03 |
| QC1203087756 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | U | ND | mg/L | | | | | 05/20/14 10:02 |
| QC1203087760 348391001 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 0.999 | mg/L | | 96.6 | (90%-110%) | | 05/20/14 10:15 |
| Batch 1387667 | | | | | | | | | | | |
| QC1203087805 348391002 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 2.88 | | 2.72 | mg/L | 5.72 | | (0%-20%) | KLP1 | 05/19/14 13:40 |
| QC1203087810 LCS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 1.00 | mg/L | | 100 | (90%-110%) | | 05/19/14 13:17 |
| QC1203087801 MB | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | | U | ND | mg/L | | | | | 05/19/14 13:16 |
| QC1203087809 348391002 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.575 | | 1.63 | mg/L | | 106 | (90%-110%) | | 05/19/14 13:41 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1387730 | | | | | | | | | | | |
| QC1203087965 348532001 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 353 | | 364 | mg/L | 3.19 | | (0%-10%) | LYG1 | 05/14/14 08:38 |
| QC1203087967 LCS | | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | | 286 | mg/L | | 95.2 | (95%-105%) | | 05/14/14 08:38 |
| QC1203087964 MB | | | | | | | | | | | |
| Total Dissolved Solids | | | | U | ND | mg/L | | | | | 05/14/14 08:38 |
| **Titration Analysis** | | | | | | | | | | | |
| Batch 1390102 | | | | | | | | | | | |
| QC1203094010 348686002 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | 58.3 | | 58.3 | mg/L | 0.00 | | (0%-20%) | LXA1 | 05/22/14 15:38 |
| Carbonate alkalinity (CaCO3) | | U | ND | U | ND | mg/L | N/A | | | | |
| QC1203094009 LCS | | | | | | | | | | | |

## QC Summary

**Workorder:** **348530**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Titration Analysis** | | | | | | | | | | |
| Batch 1390102 | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | 50.6 | mg/L | | 101 | (90%-110%) | | 05/22/14 11:13 |
| QC1203094012 MB | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | U | ND | mg/L | | | | LXA1 | 05/22/14 11:07 |
| Carbonate alkalinity (CaCO3) | | | U | ND | mg/L | | | | | |
| QC1203094011 348686002 MS | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | 58.3 | | 106 | mg/L | | 96.2 | (80%-120%) | | 05/22/14 15:45 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

## QC Summary

**Workorder:** **348530**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 15-MAY-14 | Industrial | Specifications | Process |
| **Instrument Type:** LACHAT Flow Injection Analyzer | **Test / Method:** EPA 335.4, SW846 9012B | **Matrix Type:** Liquid | **Client Code:** COMA, ESHL, OLAB, ORNL, |
| **Batch ID:** 1387858 | **Sample Numbers:** See Below | | |

**Potentially affected work order(s)(SDG):** **348498,348526(2014-3373),348527(2014-3374),348530(2014-3375),348532(2014-3376),348537(X405103),348548,348562,348565**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203088227MS,1203088228MS | 1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203088227MS<br><br>The spike recovery falls outside of the established acceptance limits due to matrix interference. 1203088228MS |

**Originator's Name:**
Aubrey Kingsbury 15-MAY-14

**Data Validator/Group Leader:**
Kristen Parson 16-MAY-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 19-MAY-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 350.1, EPA 350.1 SC | Liquid | DPNT, ESHL, GEOS |
| **Batch ID:** | **Sample Numbers:** | | |
| 1387647 | See Below | | |

**Potentially affected work order(s)(SDG): 348236,348238,348239,348527(2014-3374),348530(2014-3375),348532(2014-3376),348602**

**Application Issues:**

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203087751DUP,1203087752DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 19-MAY-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 20-MAY-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 23-MAY-14 | Industrial | Specifications | Process |
| **Instrument Type:** ELECTRODE | **Test / Method:** EPA 150.1, SW846 9040B/9040C, SW846 9040C | **Matrix Type:** Liquid | **Client Code:** ESHL, INPA, KAPL, SCPO |
| **Batch ID:** 1390573 | **Sample Numbers:** See Below | | |

**Potentially affected work order(s)(SDG):** **348527(2014-3374),348530(2014-3375),348532(2014-3376),348555,348666,348686(2014-3382),349087,349121**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Sample received out of holding:<br>348527 002,004<br>348530 002,004<br>348532 001<br>348555 001,002<br>348666 001,002<br>348686 002<br>349087 001,002,003,004<br>349121 001,003,005,007,009 | 1. Sample received out of holding |

**Originator's Name:**
Patrick Orgel 23-MAY-14

**Data Validator/Group Leader:**
Elzbieta Szulc 27-MAY-14

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

June 23, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL- WQH Water Samples
Work Order: 350826
SDG: 2014-3375-1

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on May 13, 2014, and analyzed for Metals. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Chain of Custody: 2014-3375
Enclosures

**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL- WQH Water Samples**
**Work Order #: 350826**
**SDG: 2014-3375-1**

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# Case Narrative

**Case Narrative for**
**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL- WQH Water Samples**
**Workorder #: 350826**
**SDG # : 2014-3375-1**

**June 23, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on May 13, 2014 for analysis. The sample was delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperature was checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following sample:

| Laboratory ID | Client ID |
|---|---|
| 350826001 | CAMO-14-75549 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Metals.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 23 June 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−14−9 |
| Utah NELAP | SC000122014−12 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

Relay # 350826

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

348530

ADEP

COC/Lab Request #: 2014-3375



Client Contact:

Lab Agreement # : 126310011

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| | Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-NH3+NO3/NO2+PO4 | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAMO-14-75544 | May 9 2014 | 12:41 | W | 1 | | | | 1 | | | 1 |
| | CAMO-14-75548 | May 9 2014 | 12:41 | W | | | | 1 | | 1 | 1 | |
| | CAMO-14-75545 | May 9 2014 | 11:20 | W | 1 | 2 | 3 | | 1 | | | 1 |
| 001 | CAMO-14-75549 | May 9 2014 | 11:20 | W | | | | 1 | | 1 | 1 | |
| | CAMO-14-75541 | May 9 2014 | 11:20 | W | | 2 | | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martin | 5/12/14 3:00 | | H. Taylor | 5/13/14 0920 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | | | |
|---|---|---|---|
| **Client:** LANL | | | **SDG/AR/COC/Work Order:** 2014-3375 |
| **Received By:** H Taylor | | | **Date Received:** 051314 |
| **Suspected Hazard Information** | **Yes** | **No** | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
| COC/Samples marked as radioactive? | | ✓ | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0cpm |
| Classified Radioactive II or III by RSO? | | ✓ | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | ✓ | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | ✓ | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | ✓ | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | ✓ | |

| | Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | ✓ | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) 3, 4 *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | ✓ | | | Temperature Device Serial #: 130462916 Secondary Temperature Device Serial # (If Applicable): |
| 3 | Chain of custody documents included with shipment? | ✓ | | | |
| 4 | Sample containers intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | ✓ | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | ✓ | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | ✓ | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | ✓ | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | ✓ | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | ✓ | | | Sample ID's affected: CAMO-14-75541 received 1 vial, chain indicates 2 CAMO-14-75545 received 2 containers, chain indicates 3 |
| 11 | Number of containers received match number indicated on COC? | | | ✓ | Sample ID's affected: |
| 12 | Are sample containers identifiable as GEL provided? | | | ✓ | |
| 13 | COC form is properly signed in relinquished/received sections? | ✓ | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 5908 1777 0380-3 0417-4 0406-3 0391-4 0370-3 |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials Hope Taylor Date 051314 Page 1 of 1

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A01407Q00

3c

518C1/E2B3/5F03

FedEx Express

9210 2568 3118 1117

2 of 2
MPS# 0263 5908 1777 0380
Mstr# 5908 1777 0370

0201

TUE - 13 MAY 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 46.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWL0

4C

518C1/62D3/6F03

FedEx Express

J131113052301 26

TRK# 0201 5908 1777 0417

TUE - 13 MAY 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 158148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWK0

3C

518C1/62D3/6F03

FedEx Express

J131113052301 26

2 of 2

MPS# 0263 5908 1777 0406
Mstr# 5908 1777 0391 0201

TUE - 13 MAY 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (50[illegible] [illegible] 9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWK0

2b

FedEx Express

1 of 2

TRK# 0201 5908 1777 0391

TUE - 13 MAY 10:30A
PRIORITY OVERNIGHT

## MASTER ##

XX CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12MAY14
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A01407Q00

FedEx Express

1 of 2

TRK# 0201 5908 1777 0370

TUE - 13 MAY 10:30A
PRIORITY OVERNIGHT

## MASTER ##

XX CHSA

3c

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

**Subject:** Hey Val - maybe Bottles switched?? FW: follow up on R-46
**From:** "Patel, Nita" <npatel@lanl.gov>
**Date:** 6/17/2014 1:12 PM
**To:** "Valerie Davis (vsd@gel.com)" <vsd@gel.com>

See below? Sorry to bombard you with emails today..

---

**From:** Rogers, David B
**Sent:** Tuesday, June 17, 2014 11:10 AM
**To:** Patel, Nita
**Cc:** Katzman, Danny; Goering, Tim J; Ding, Mei; Macgregor, Alan S
**Subject:** follow up on R-46

Hi Nita;

I wonder if sample bottles were switched for R-42 and R-46? Is there a way we can look at the bottles and have them checked and reanalyzed?

Can you have the lab track the R-42 bottles along with the R-46 bottles? Can we establish whether these two bottles were switched at some point?

This applies to all the SW-846:6010C and SW-846:6020 results for R-42 and R-46.

The SW-846:6010C for R-42 includes CAMO-14-75863, 2014-3376, 11503777. The SW-846:602 information for R-42 is below.

The 5/8/14 R-42 results show the unusually high antimony that R-46 usually shows, while is was nondetect in R-46 this time. This is unusual for R-42; the antimony field sample result is 11503771.

Thanks, David

| Location ID | Date Sampled | Analytical Method | Parameter Name | Analysis Type Code | Sample Purpose | Field Prep Code | Report Result |
|---|---|---|---|---|---|---|---|
| R-42 | 05/08/14 | SW-846:6020 | Chromium | INIT | REG | F | 5.84 |

| Location ID | Date Sampled | Analytical Method | Parameter Name | Analysis Type Code | Sample Purpose | Field Prep Code | Report Result | Re MI |
|---|---|---|---|---|---|---|---|---|
| R-46 | 05/09/14 | SW-846:6020 | Chromium | INIT | REG | F | 923 | 2 |

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# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-3375-1**

**Sample Analysis**

| Sample ID | Client ID |
|---|---|
| 350826001 | CAMO-14-75549 |
| 1203110992 | Method Blank (MB) **ICP** |
| 1203110993 | Laboratory Control Sample (LCS) |
| 1203110996 | 350826001(CAMO-14-75549L) Serial Dilution (SD) |
| 1203110994 | 350826001(CAMO-14-75549D) Sample Duplicate (DUP) |
| 1203110995 | 350826001(CAMO-14-75549S) Matrix Spike (MS) |
| 1203110997 | Method Blank (MB) **ICP-MS** |
| 1203110998 | Laboratory Control Sample (LCS) |
| 1203111001 | 350826001(CAMO-14-75549L) Serial Dilution (SD) |
| 1203110999 | 350826001(CAMO-14-75549D) Sample Duplicate (DUP) |
| 1203111000 | 350826001(CAMO-14-75549S) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**Method/Analysis Information**

| | |
|---|---|
| **Analytical Batch:** | 1396634 and 1396636 |
| **Prep Batch :** | 1396633 and 1396635 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 10 and GL-MA-E-014 REV# 25 |
| **Analytical Method:** | SW846 3005A/6010C and SW846 3005A/6020A |
| **Prep Method :** | SW846 3005A |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN DRC-e inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector, and dynamic reaction cell. The DRC-e uses a dynamic reaction cell to eliminate polyatomic interferences. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

## Calibration Information

**Instrument Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL/PQL Requirements**
All PQL standards for 6010C met the control limits with the exception of tin listed below. The sample concentrations were less than the MDL or greater than 2x the PQL, so the data is not adversely affected.
350826001 (CAMO-14-75549)-ICP.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blanks (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 350826001 (CAMO-14-75549)-ICP and ICP-MS.

**Matrix Spike (MS) Recovery Statement**

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Sample required dilutions for tin in order to minimize suppression due to matrix interferences. 350826001 (CAMO-14-75549)-ICP.

**Preparation Information**
The samples in this SDG were prepared exactly according to the cited SOP.

## Miscellaneous Information

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-3375-1  GEL Work Order: 350826

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Nik-Cole A. Elmore  **Name:** **Nik-Cole Elmore**

**Date:** **23 JUN 2014**  **Title:** **Data Validator**

# Sample Data Summary

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−3375−1 **CONTRACT:** ESHL00114 **METHOD TYPE:** SW846

**SAMPLE ID:** 350826001 **BASIS:** As Received **DATE COLLECTED** 09−MAY−14

**CLIENT ID:** CAMO−14−75549 **LEVEL:** Low **DATE RECEIVED** 13−MAY−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−36−0 | Antimony | 5.18 | ug/L | | 1 | 3 | 3 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−38−2 | Arsenic | 5 | ug/L | U | 1.7 | 5 | 5 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−39−3 | Barium | 22.3 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−42−8 | Boron | 50 | ug/L | U | 15 | 50 | 50 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−70−2 | Calcium | 9460 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−47−3 | Chromium | 5.32 | ug/L | J | 2 | 10 | 10 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7439−95−4 | Magnesium | 3040 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7439−98−7 | Molybdenum | 0.902 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 06/19/14 12:55 | 140619−3 | 1396636 |
| 7440−02−0 | Nickel | 0.672 | ug/L | J | 0.5 | 2 | 2 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−09−7 | Potassium | 1710 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−23−5 | Sodium | 9150 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−24−6 | Strontium | 40.3 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−31−5 | Tin | 50 | ug/L | U | 12.5 | 50 | 50 | 5 | P | HSC | 06/19/14 16:13 | 061914−1 | 1396634 |
| 7440−61−1 | Uranium | 0.458 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 06/18/14 21:35 | 140618−2 | 1396636 |
| 7440−62−2 | Vanadium | 6.45 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |
| 7440−66−6 | Zinc | 3.83 | ug/L | J | 3.3 | 10 | 10 | 1 | P | HSC | 06/19/14 14:47 | 061914−1 | 1396634 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1396634 | 1396633 | SW846 3005A | 50 | mL | 50 | mL | 06/18/14 | KXP3 |
| 1396636 | 1396635 | SW846 3005A | 50 | mL | 50 | mL | 06/18/14 | KXP3 |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**MS SW846 3005A/6020A**

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2014−3375−1

**Contract:** ESHL00114

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203110992 | | | | | | | | |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 50 | ug/L | +/−150 | U | P | 50 | 150 |
| | Sodium | 100 | ug/L | +/−300 | U | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Tin | 4.12 | ug/L | +/−10 | J | P | 2.5 | 10 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| 1203110997 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3375−1 **Client ID** CAMO−14−75549S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 350826001 **Spike ID:** 1203110995

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 4720 | | 68 | U | 5000 | 93.7 | | P |
| Barium | ug/L | 75−125 | 502 | | 22.3 | | 500 | 95.9 | | P |
| Beryllium | ug/L | 75−125 | 490 | | 1 | U | 500 | 97.9 | | P |
| Boron | ug/L | 75−125 | 481 | | 15 | U | 500 | 94.2 | | P |
| Calcium | ug/L | 75−125 | 14300 | | 9460 | | 5000 | 96.8 | | P |
| Cobalt | ug/L | 75−125 | 479 | | 1 | U | 500 | 95.7 | | P |
| Copper | ug/L | 75−125 | 498 | | 3 | U | 500 | 99.5 | | P |
| Iron | ug/L | 75−125 | 4930 | | 30 | U | 5000 | 98.6 | | P |
| Magnesium | ug/L | 75−125 | 8130 | | 3040 | | 5000 | 102 | | P |
| Manganese | ug/L | 75−125 | 490 | | 2 | U | 500 | 97.8 | | P |
| Potassium | ug/L | 75−125 | 6540 | | 1710 | | 5000 | 96.5 | | P |
| Sodium | ug/L | 75−125 | 14700 | | 9150 | | 5000 | 110 | | P |
| Strontium | ug/L | 75−125 | 521 | | 40.3 | | 500 | 96.1 | | P |
| Tin | ug/L | 75−125 | 557 | | 12.5 | U | 500 | 111 | | P |
| Vanadium | ug/L | 75−125 | 507 | | 6.45 | | 500 | 100 | | P |
| Zinc | ug/L | 75−125 | 492 | | 3.83 | J | 500 | 97.6 | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−3375−1 **Client ID** CAMO−14−75549S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 350826001 **Spike ID:** 1203111000

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Nickel | ug/L | 75−125 | 47.7 | | 0.672 | J | 50 | 94 | | MS |
| Selenium | ug/L | 75−125 | 48.3 | | 1.5 | U | 50 | 96.1 | | MS |
| Silver | ug/L | 75−125 | 50.5 | | 0.2 | U | 50 | 101 | | MS |
| Thallium | ug/L | 75−125 | 48 | | 0.45 | U | 50 | 96 | | MS |
| Uranium | ug/L | 75−125 | 52.6 | | 0.458 | | 50 | 104 | | MS |
| Antimony | ug/L | 75−125 | 53.5 | | 5.18 | | 50 | 96.7 | | MS |
| Arsenic | ug/L | 75−125 | 47.7 | | 1.7 | U | 50 | 92.9 | | MS |
| Cadmium | ug/L | 75−125 | 49.2 | | 0.11 | U | 50 | 98.4 | | MS |
| Chromium | ug/L | 75−125 | 53.3 | | 5.32 | J | 50 | 96 | | MS |
| Lead | ug/L | 75−125 | 48.8 | | 0.5 | U | 50 | 97.6 | | MS |
| Molybdenum | ug/L | 75−125 | 46 | | 0.902 | | 50 | 90.1 | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3375−1 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** CAMO−14−75549D

**Matrix:** WATER **Level:** Low

**Sample ID:** 350826001 **Duplicate ID:** 1203110994 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−5 | 22.3 | | 21.7 | | 2.46 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | | 15 | U | 15 | U | | | P |
| Calcium | ug/L | +/−20% | 9460 | | 9600 | | 1.5 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−20% | 3040 | | 3090 | | 1.52 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 1710 | | 1760 | | 2.74 | | P |
| Sodium | ug/L | +/−20% | 9150 | | 9350 | | 2.24 | | P |
| Strontium | ug/L | +/−20% | 40.3 | | 41.4 | | 2.52 | | P |
| Tin | ug/L | | 12.5 | U | 12.5 | U | | | P |
| Vanadium | ug/L | +/−5 | 6.45 | | 6.69 | | 3.6 | | P |
| Zinc | ug/L | +/−10 | 3.83 | J | 3.3 | J | 14.7 | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−3375−1 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** CAMO−14−75549D

**Matrix:** WATER **Level:** Low

**Sample ID:** 350826001 **Duplicate ID:** 1203110999 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | +/−3 | 5.18 | | 5.28 | | 1.93 | | MS |
| Arsenic | ug/L | | 1.7 | U | 1.7 | U | | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | +/−10 | 5.32 | J | 4.97 | J | 6.81 | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 0.902 | | 0.869 | | 3.73 | | MS |
| Nickel | ug/L | +/−2 | 0.672 | J | 0.715 | J | 6.2 | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−.2 | 0.458 | | 0.468 | | 2.16 | | MS |

***Analytical Methods:**

**MS SW846 3005A/6020A**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3375−1

**Contract:** ESHL00114

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203110993 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 4770 | | 95.5 | 80−120 | P |
| | Barium | ug/L | 500 | 476 | | 95.2 | 80−120 | P |
| | Beryllium | ug/L | 500 | 476 | | 95.2 | 80−120 | P |
| | Boron | ug/L | 500 | 455 | | 91.1 | 80−120 | P |
| | Calcium | ug/L | 5000 | 4790 | | 95.7 | 80−120 | P |
| | Cobalt | ug/L | 500 | 472 | | 94.4 | 80−120 | P |
| | Copper | ug/L | 500 | 475 | | 95 | 80−120 | P |
| | Iron | ug/L | 5000 | 4960 | | 99.3 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 4990 | | 99.8 | 80−120 | P |
| | Manganese | ug/L | 500 | 483 | | 96.7 | 80−120 | P |
| | Potassium | ug/L | 5000 | 4830 | | 96.6 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5010 | | 100 | 80−120 | P |
| | Strontium | ug/L | 500 | 489 | | 97.8 | 80−120 | P |
| | Tin | ug/L | 500 | 487 | | 97.4 | 80−120 | P |
| | Vanadium | ug/L | 500 | 494 | | 98.8 | 80−120 | P |
| | Zinc | ug/L | 500 | 476 | | 95.2 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−3375−1

**Contract:** ESHL00114

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203110998 | | | | | | | | |
| | Uranium | ug/L | 50 | 51.1 | | 102 | 80−120 | MS |
| | Antimony | ug/L | 50 | 49.3 | | 98.7 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 47.1 | | 94.2 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 49.3 | | 98.5 | 80−120 | MS |
| | Chromium | ug/L | 50 | 49.5 | | 99 | 80−120 | MS |
| | Lead | ug/L | 50 | 47.6 | | 95.2 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 47.2 | | 94.3 | 80−120 | MS |
| | Nickel | ug/L | 50 | 49.6 | | 99.2 | 80−120 | MS |
| | Selenium | ug/L | 50 | 47.7 | | 95.4 | 80−120 | MS |
| | Silver | ug/L | 50 | 50.1 | | 100 | 80−120 | MS |
| | Thallium | ug/L | 50 | 46.4 | | 92.8 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3375−1 **Client ID** CAMO−14−75549L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 350826001 **Serial Dilution ID:** 1203110996

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 22.3 | | 22.3 | J | .258 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 15 | U | 75 | U | | | | P |
| Calcium | 9460 | | 9380 | | .882 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 3040 | | 3030 | | .367 | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 1710 | | 1500 | | 12.4 | | | P |
| Sodium | 9150 | | 8840 | | 3.34 | | 10 | P |
| Strontium | 40.3 | | 42.1 | | 4.36 | | | P |
| Tin | 2.5 | U | 12.5 | J | | | | P |
| Vanadium | 6.45 | | 6.68 | J | 3.44 | | | P |
| Zinc | 3.83 | J | 16.5 | U | 100 | | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−3375−1 **Client ID** CAMO−14−75549L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 350826001 **Serial Dilution ID:** 1203111001

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 5.18 | | 5 | U | 100 | | | MS |
| Arsenic | 1.7 | U | 8.5 | U | | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 5.32 | J | 10 | U | 100 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | .902 | | 1.01 | J | 12 | | | MS |
| Nickel | .672 | J | 2.5 | U | 100 | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | .458 | | .42 | J | 8.3 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEQ

COC/Lab Request #: 2014-4642



Client Contact:

Lab Agreement # : 126310011

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8011-TB | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8151A-PCP | ~~WSP-LL-0200B~~ | ~~WSP-LL-0200B-TB~~ | ~~WSP-LL-8270C~~ | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | WSP-8260-TB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86942 | Sep 29 2014 | 10:21 | W | 1 | 2 | | 3 | 2 | | | | | 1 | | 1 | | | | | | 1 | 1 | |
| CAWR-14-86969 | Sep 29 2014 | 10:21 | W | | | | | | | | | 1 | | 1 | | | | | | 1 | | | |
| CAWR-14-86892 | Sep 29 2014 | 10:21 | W | | | | | | 2 | 2 | 3 | | | | | 2 | | | | | | | |
| CAWR-14-86915 | Sep 29 2014 | 10:21 | W | | | 1 | | 2 | | | | | | | | | | | | | | | 1 |
| CAWR-14-86943 | Sep 29 2014 | 12:20 | W | | | | | | | 2 | | | | | | 2 | | | | | | | |
| CAWR-14-86916 | Sep 29 2014 | 12:20 | W | | | 1 | | | | | | | | | | | | 1 | | | | | 1 |
| CAWR-14-87098 | Sep 29 2014 | 12:20 | W | | 2 | | | | | | | | | | | | 2 | | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martz | 9/30/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86892

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1021 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Spring 1 | | | FIELD PREP: | UF | OK |
| LOCATION TYPE: SUP | | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | Y | N/A |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS | ~~3~~ 2 | ICE | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 6.18 mg/L  Flow (in gpm) 3.14 GPM  Oxidation-Reduction Potential 183.3 mV

pH 7.28 SU  Specific Conductance 216 uS/cm  Temperature 18.94 deg C

Turbidity 3.5 NTU

**COLLECTED BY (PRINT)** S. Armack, K. Reid

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Ulrich<br>(Signature) Andrew Ulrich | 9/29/14 1620 | (Printed Name) S. Sherwood<br>(Signature) S. Sherwood | 9/29/14 1620 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86915

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | QC |
| TIME COLLECTED (HH:MM): | | 1021 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | WS 9/29/14 PP DC |
| LOCATION ID: Spring 1 | | | FIELD PREP: | UF | QC |
| LOCATION TYPE: | | | FIELD QC TYPE: | FTB | |
| PORT: | | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS WS 9/29/14 | 2 | HCL | | |
| | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ WS 9/29/14 HCL | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:** WS 9/29/14

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** S Aumack, K Reid

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Vigil<br>(Signature) Andrew Vigil | 9/29/14 1620 | (Printed Name) S. Sherwood<br>(Signature) S. Sherwood | 9/29/14 1620 |
| **RELINQUISHED BY** | **Date/Time** | **RECEIVED BY** | **Date/Time** |
| (Printed Name)<br>(Signature) | | (Printed Name)<br>(Signature) | |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86916

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1220 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: Spring 2 | | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | FTB | |
| PORT: | | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | N/A |
| N/A | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ HCL | Y | N/A |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:** WS 9/29/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** S Armack

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Ulch<br>(Signature) | 9/29/14 1620 | (Printed Name) S Sherwood<br>(Signature) | 9/29/14 1620 |
| **RELINQUISHED BY** | **Date/Time** | **RECEIVED BY** | **Date/Time** |
| (Printed Name)<br>(Signature) | | (Printed Name)<br>(Signature) | |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86942

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1021 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Spring 1 | | FIELD PREP: | UF | OK |
| LOCATION TYPE: | SPR | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | 2 | ICE 9/29/14 | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

| | | | |
|---|---|---|---|
| **EVENT ID:** | 6888 | **EVENT NAME:** | White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event |
| **SAMPLE ID:** | CAWR-14-86942 | **WORK ORDER:** | NA |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 6.18 mg/L Flow (in gpm) 3.14 GPM Oxidation-Reduction Potential 183.3 mV

pH 7.78 SU Specific Conductance 216 uS/cm Temperature 18.94 deg C

Turbidity 3.5 NTU

**COLLECTED BY (PRINT)** S. Armack, K. Reid

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) ANDREW VIGIL<br>(Signature) | 9/29/14 1620 | (Printed Name) S. Sherwood<br>(Signature) | 9/29/14 1620 |
| **RELINQUISHED BY**<br>**(Printed Name)**<br>**(Signature)** | **Date/Time** | **RECEIVED BY**<br>**(Printed Name)**<br>**(Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86943 **WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1220 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Spring 2 | | FIELD PREP: | UF | OK |
| LOCATION TYPE: | SPR | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | Y | N/A |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** S-Armada

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) ANDREW VIGIL<br>(Signature) | 9/29/14 1620 | (Printed Name) S. Sherwood<br>(Signature) | 9/29/14 1620 |
| **RELINQUISHED BY** | **Date/Time** | **RECEIVED BY** | **Date/Time** |
| (Printed Name)<br>(Signature) | | (Printed Name)<br>(Signature) | |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86969 **WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1024 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Spring 1 | | FIELD PREP: | F | OK |
| LOCATION TYPE: | SPR | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | N/A |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:** WS 9/29/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** S. Armack, K Reid

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Vigil<br>(Signature) | 9/29/14 1620 | (Printed Name) S Sherwood<br>(Signature) | 9/29/14 1620 |
| **RELINQUISHED BY** | **Date/Time** | **RECEIVED BY** | **Date/Time** |
| (Printed Name)<br>(Signature) | | (Printed Name)<br>(Signature) | |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-87098

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 0920 | MEDIA: | UA | ✓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Spring 2 | ✓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | SPR | ✓ | FIELD QC TYPE: | REG | ✓ |
| PORT: | | ✓ | SAMPLE USAGE: | | ✓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | Y | N/A |
| N/A | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | N/A |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 6.32 mg/L  Flow (in gpm) 0.17gpm GPM  Oxidation-Reduction Potential N/A mV

pH 7.96 SU  Specific Conductance 195 uS/cm  Temperature 17.76 deg C

Turbidity 13.4 NTU

**COLLECTED BY (PRINT)** S. Armack

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Vigil<br>(Signature) | 9/29/14 1620 | (Printed Name) S. Sherwood<br>(Signature) | 9/29/14 1620 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 09/16/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-4642

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 357745 | EPA:120.1 | 1 | | | | |
| 357745 | EPA:150.1 | 1 | | | | |
| 357745 | EPA:160.1 | 1 | | | | |
| 357745 | EPA:245.2 | 2 | | | | |
| 357745 | EPA:300.0 | 1 | | | | |
| 357745 | EPA:310.1 | 1 | | | | |
| 357745 | EPA:335.4 | 1 | | | | |
| 357745 | EPA:350.1 | 1 | | | | |
| 357745 | EPA:351.2 | 1 | | | | |
| 357745 | EPA:353.2 | 1 | | | | |
| 357745 | EPA:365.4 | 1 | | | | |
| 357745 | EPA:900 | 1 | | | | |
| 357745 | EPA:901.1 | 1 | | | | |
| 357745 | EPA:905.0 | 1 | | | | |
| 357745 | HASL-300:AM-241 | 1 | | | | |
| 357745 | HASL-300:ISOPU | 1 | | | | |
| 357745 | HASL-300:ISOU | 1 | | | | |
| 357745 | SM:A2340B | 1 | | | | |
| 357745 | SW-846:6010C | 1 | | | | |
| 357745 | SW-846:6020 | 1 | | | | |
| 357745 | SW-846:6850 | 1 | | | | |
| 357745 | SW-846:8011 | 2 | | 2 | | |
| 357745 | SW-846:8082 | 1 | | | | |
| 357745 | SW-846:8151A | 2 | | | | |
| 357745 | SW-846:8260B | 1 | | 2 | | |
| 357745 | SW-846:8270D | 1 | | | | |
| 357745 | SW-846:8310 | 2 | | | | |
| 357745 | SW-846:8321A_MOD | 1 | | | | |
| 357745 | SW-846:9060 | 1 | | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 357745 | EPA:120.1 | 1423966 | 1423966 | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 357745 | EPA:150.1 | 1424028 | 1424028 | 1 | | | | | | | | | | 1 | | | | 1 | | | |
| 357745 | EPA:160.1 | 1423636 | 1423636 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 357745 | EPA:245.2 | 1424248 | 1424247 | 2 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 357745 | EPA:300.0 | 1425103 | 1425103 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 357745 | EPA:310.1 | 1424179 | 1424179 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 357745 | EPA:335.4 | 1424679 | 1424677 | 1 | | | | | 1 | 2 | | | | 1 | | | | 2 | | | |
| 357745 | EPA:350.1 | 1424400 | 1424399 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 357745 | EPA:351.2 | 1423718 | 1423716 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 357745 | EPA:353.2 | 1423722 | 1423722 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 357745 | EPA:365.4 | 1423721 | 1423719 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 357745 | EPA:900 | 1425562 | 1425562 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | 1 | | | |
| 357745 | EPA:901.1 | 1423982 | 1423982 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 357745 | EPA:905.0 | 1424874 | 1424874 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 357745 | HASL-300:AM-241 | 1427568 | 1427568 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 357745 | HASL-300:ISOPU | 1423583 | 1423583 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 357745 | HASL-300:ISOU | 1423584 | 1423584 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 357745 | SM:A2340B | 1431368 | 1431368 | 1 | | | | | | | | | | | | | | | | | |
| 357745 | SW-846:6010C | 1423534 | 1423533 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 357745 | SW-846:6020 | 1423529 | 1423528 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 357745 | SW-846:6850 | 1424653 | 1424652 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 357745 | SW-846:8011 | 1424420 | 1424419 | 2 | | 1 | | | 1 | | | | | 1 | 1 | | | | | | |
| 357745 | SW-846:8011 | 1424504 | 1424503 | | | 1 | | | 1 | | | | | 1 | 1 | | | | | | |
| 357745 | SW-846:8082 | 1424177 | 1424176 | 1 | | | | | 1 | 1 | | | | 1 | 1 | | | | | | |
| 357745 | SW-846:8151A | 1424174 | 1424173 | 2 | | | | | 1 | 1 | | | | 1 | 1 | | | | | | |
| 357745 | SW-846:8260B | 1426455 | 1426455 | 1 | | 2 | | | 1 | | | | | 2 | | | | | | | |
| 357745 | SW-846:8270D | 1423498 | 1423494 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 357745 | SW-846:8310 | 1424545 | 1424544 | 2 | | | | | 1 | 1 | | | | 1 | 1 | | | | | | |
| 357745 | SW-846:8321A_MOD | 1423664 | 1423661 | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |
| 357745 | SW-846:9060 | 1425465 | 1425465 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |

# DATA VALIDATION REPORT

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-86969 | 1203179267 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203179265 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203179440 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | WST55-14-87515 | 1203179442 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-86969 | 1203178479 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203178478 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203178477 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86942 | 1203179973 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86942 | 1203179974 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86942 | 357745003 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203179972 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203179971 | MB | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-86969 | 357745004 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203182076 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203182075 | MB | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | WST63-14-87514 | 1203182077 | DUP | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-86969 | 357745004 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203179814 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203179812 | MB | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | WST63-14-87514 | 1203179818 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | WST63-14-87514 | 1203179822 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86942 | 1203181020 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86942 | 1203181022 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86942 | 357745003 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86945 | 1203181021 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86945 | 1203181023 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203181019 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203181018 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86972 | 1203180367 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86972 | 1203180368 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203180364 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203180363 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86942 | 1203178665 | DUP | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86942 | 1203178666 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86942 | 357745003 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203178664 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203178663 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-86969 | 1203178680 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203178679 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203178678 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86969 | 1203178676 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86969 | 1203178677 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203178675 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203178674 | MB | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | CAWR-14-86932 | 1203183245 | DUP | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAWR-14-86932 | 1203183246 | MS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | CAWR-14-86932 | 1203183247 | MSD | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | CAWR-14-86942 | 357745003 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | LCS | 1203183248 | LCS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | MB | 1203183244 | MB | 2 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-86942 | 1203179288 | DUP | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-86942 | 357745003 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | LCS | 1203179289 | LCS | 0 | 0 | 3 | 0 |
| EPA:901.1 | RAD | MB | 1203179287 | MB | 5 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAWR-14-86933 | 1203181457 | DUP | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAWR-14-86933 | 1203181458 | MS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | CAWR-14-86942 | 357745003 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | LCS | 1203181459 | LCS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | MB | 1203181456 | MB | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-86942 | 1203188104 | DUP | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-86942 | 357745003 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | LCS | 1203188105 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:AM-241 | RAD | MB | 1203188103 | MB | 1 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-86942 | 1203178350 | DUP | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-86942 | 357745003 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | LCS | 1203178351 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOPU | RAD | MB | 1203178349 | MB | 2 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-86942 | 1203178353 | DUP | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-86942 | 357745003 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | LCS | 1203178354 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOU | RAD | MB | 1203178352 | MB | 3 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SM:A2340B | INORGANIC | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86969 | 1203178256 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86969 | 1203178257 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86969 | 357745004 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203178255 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203178254 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86969 | 1203178251 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86969 | 1203178252 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86969 | 357745004 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203178250 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203178249 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-86960 | 1203180962 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-86960 | 1203180963 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-86969 | 357745004 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203180961 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203180960 | MB | 1 | 0 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86915 | 357745009 | FTB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86916 | 357745013 | FTB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86942 | 357745001 | REG | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-87098 | 357745015 | REG | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | LCS | 1203180413 | LCS | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | LCS | 1203180607 | LCS | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | LCSD | 1203180414 | LCSD | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | LCSD | 1203180608 | LCSD | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | MB | 1203180617 | MB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | MB | 1203180618 | MB | 2 | 1 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-86942 | 1203179792 | MS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-86942 | 357745002 | REG | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | LCS | 1203179785 | LCS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | LCSD | 1203179793 | LCSD | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | MB | 1203179784 | MB | 8 | 2 | 0 | 0 |
| SW-846:8151A | HERB | CAWR-14-86888 | 1203179781 | MS | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | CAWR-14-86892 | 357745008 | REG | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | CAWR-14-86943 | 357745012 | REG | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | LCS | 1203179780 | LCS | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | LCSD | 1203179783 | LCSD | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | MB | 1203179779 | MB | 1 | 1 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86915 | 357745010 | FTB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86916 | 357745014 | FTB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86942 | 357745003 | REG | 78 | 3 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8260B | VOC | LCS | 1203185450 | LCS | 0 | 3 | 68 | 0 |
| SW-846:8260B | VOC | LCS | 1203185515 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203185449 | MB | 78 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86890 | 1203178177 | MS | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86890 | 1203178179 | MSD | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86892 | 357745005 | REG | 61 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | LCS | 1203178176 | LCS | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | MB | 1203178175 | MB | 61 | 6 | 0 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86888 | 1203180727 | MS | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86892 | 357745006 | REG | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86943 | 357745011 | REG | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | LCS | 1203180726 | LCS | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | LCSD | 1203180729 | LCSD | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | MB | 1203180725 | MB | 18 | 1 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | CAWR-14-86892 | 357745007 | REG | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | LCS | 1203178539 | LCS | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | LCSD | 1203178540 | LCSD | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | MB | 1203178538 | MB | 20 | 2 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-86942 | 357745003 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-86951 | 1203182976 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203182975 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203182974 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

| Field Sample ID | Lab Sample ID | Analytical Method | Sample Date | Extraction Date | Analysis Date | Extraction Hold Time | Max Extract Hold Time | Reject Above | Exceeds Limit | Analysis Hold Time | Max Analysis Hold Time | Reject Above | Exceeds Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86915 | 357745009 | SW-846:8011 | 09-29-2014 | | 10-13-2014 | NA | | | | 14 | 14 | 28 | X |

# DATA VALIDATION REPORT

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203180363 | METHOD BLANK | EPA:350.1 | W | Ammonia as Nitrogen | 0.0373 | J | mg/L | 0.050 |

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86969 | 1203180363 | METHOD BLANK | EPA:350.1 | Ammonia as Nitrogen | 0.0373 | mg/L | 0.0327 | J | 0.050 | Y | 5 | 100 | Y |

6. Any surrogate recoveries outside the control limits?

| Field Sample ID | Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Spike Recovery | Upper Limit | Lower Limit | Rejection Limit |
|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86916 | 357745013 | SW-846:8011 | Bromofluorobenzene[4-] | 1424420 | 10-06-2014 | 228 | 145 | 56 | 10 |
| LCSD | 1203179783 | SW-846:8151A | 2,4-Dichlorophenylacetic acid | 1424174 | 10-07-2014 | 150 | 138 | 40 | 10 |

7. Any MS/MSD recoveries or RPDs outside the control limits?

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86972 | 1203180368 | | EPA:350.1 | Ammonia as Nitrogen | 1424399 | 10-09-2014 | W | 111 | | 110 | 90 | 10 | | |
| CAWR-14-86932 | 1203183246 | 1203183247 | EPA:900 | Gross beta | 1425562 | 10-11-2014 | W | 88.7 | 118 | 125 | 75 | 10 | 28.1 | 20 |

# DATA VALIDATION REPORT

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203178539 | 1203178540 | SW-846:8321A_MOD | Tetryl | 1423661 | 10-18-2014 | W | 73 | 56 | 117 | 62 | | 10 | 25 | 19 |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 1 | 2014-4642 | CAWR-14-86892 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Tetryl | U | UJ | HE12a | N | 0.581 | ug/L | 0.581 | ug/L | | | W | 09/29/2014 | | 1423664 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | 0 | pCi/L | 0 | pCi/L | 0.0527 | 0.00666 | W | 09/29/2014 | | 1427568 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | -.765 | pCi/L | -.765 | pCi/L | 4.78 | 1.38 | W | 09/29/2014 | | 1423982 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | 5.67 | pCi/L | 5.67 | pCi/L | 6.80 | 1.51 | W | 09/29/2014 | | 1423982 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | 2.52 | pCi/L | 2.52 | pCi/L | 2.87 | 0.939 | W | 09/29/2014 | | 1425562 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | EPA:900 | Gross beta | U | U | R5 | N | 1.24 | pCi/L | 1.24 | pCi/L | 2.88 | 0.878 | W | 09/29/2014 | | 1425562 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | -1.26 | pCi/L | -1.26 | pCi/L | 8.03 | 2.36 | W | 09/29/2014 | | 1423982 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | 0 | pCi/L | 0 | pCi/L | 0.0415 | 0.00395 | W | 09/29/2014 | | 1423583 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -.00279 | pCi/L | -.00279 | pCi/L | 0.0366 | 0.0128 | W | 09/29/2014 | | 1423583 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | 7.32 | pCi/L | 7.32 | pCi/L | 38.6 | 22.2 | W | 09/29/2014 | | 1423982 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | -1.4 | pCi/L | -1.4 | pCi/L | 4.51 | 1.34 | W | 09/29/2014 | | 1423982 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | -.0176 | pCi/L | -.0176 | pCi/L | 0.480 | 0.136 | W | 09/29/2014 | | 1424874 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86942 | REG | INIT | RAD | HASL-300:ISOU | Uranium-235/236 | U | U | R5 | N | .0298 | pCi/L | .0298 | pCi/L | 0.0472 | 0.011 | W | 09/29/2014 | | 1423584 | VAL | Y |
| Spring 1 | 2014-4642 | CAWR-14-86969 | REG | INIT | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | J | U | I4 | N | 0.0327 | mg/L | 0.0327 | mg/L | | | W | 09/29/2014 | | 1424400 | VAL | Y |

| Reason Code | Description |
|---|---|
| HE12a | The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits. |
| I4 | the sample result is =<5x the concentration of related analyte in the method blank. |
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| R5 | Analyte is not detected because the amount reported is less than the MDC. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86892 | Spring 1 | REG | SW-846:8151A | 0 | 1 |
| CAWR-14-86892 | Spring 1 | REG | SW-846:8270D | 0 | 61 |
| CAWR-14-86892 | Spring 1 | REG | SW-846:8310 | 0 | 18 |
| CAWR-14-86892 | Spring 1 | REG | SW-846:8321A_MOD | 0 | 20 |
| CAWR-14-86915 | Spring 1 | FTB | SW-846:8011 | 0 | 2 |
| CAWR-14-86915 | Spring 1 | FTB | SW-846:8260B | 0 | 78 |
| CAWR-14-86916 | Spring 2 | FTB | SW-846:8011 | 0 | 2 |
| CAWR-14-86916 | Spring 2 | FTB | SW-846:8260B | 0 | 78 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86942 | Spring 1 | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-86942 | Spring 1 | REG | EPA:335.4 | 0 | 1 |
| CAWR-14-86942 | Spring 1 | REG | EPA:351.2 | 0 | 1 |
| CAWR-14-86942 | Spring 1 | REG | EPA:900 | 0 | 2 |
| CAWR-14-86942 | Spring 1 | REG | EPA:901.1 | 0 | 5 |
| CAWR-14-86942 | Spring 1 | REG | EPA:905.0 | 0 | 1 |
| CAWR-14-86942 | Spring 1 | REG | HASL-300:AM-241 | 0 | 1 |
| CAWR-14-86942 | Spring 1 | REG | HASL-300:ISOPU | 0 | 2 |
| CAWR-14-86942 | Spring 1 | REG | HASL-300:ISOU | 0 | 3 |
| CAWR-14-86942 | Spring 1 | REG | SW-846:8011 | 0 | 2 |
| CAWR-14-86942 | Spring 1 | REG | SW-846:8082 | 0 | 8 |
| CAWR-14-86942 | Spring 1 | REG | SW-846:8260B | 0 | 78 |
| CAWR-14-86942 | Spring 1 | REG | SW-846:9060 | 0 | 1 |
| CAWR-14-86943 | Spring 2 | REG | SW-846:8151A | 0 | 1 |
| CAWR-14-86943 | Spring 2 | REG | SW-846:8310 | 0 | 18 |
| CAWR-14-86969 | Spring 1 | REG | EPA:120.1 | 0 | 1 |
| CAWR-14-86969 | Spring 1 | REG | EPA:150.1 | 0 | 1 |
| CAWR-14-86969 | Spring 1 | REG | EPA:160.1 | 0 | 1 |
| CAWR-14-86969 | Spring 1 | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-86969 | Spring 1 | REG | EPA:300.0 | 0 | 4 |
| CAWR-14-86969 | Spring 1 | REG | EPA:310.1 | 0 | 2 |
| CAWR-14-86969 | Spring 1 | REG | EPA:350.1 | 0 | 1 |
| CAWR-14-86969 | Spring 1 | REG | EPA:353.2 | 0 | 1 |
| CAWR-14-86969 | Spring 1 | REG | EPA:365.4 | 0 | 1 |
| CAWR-14-86969 | Spring 1 | REG | SM:A2340B | 0 | 1 |
| CAWR-14-86969 | Spring 1 | REG | SW-846:6010C | 0 | 17 |
| CAWR-14-86969 | Spring 1 | REG | SW-846:6020 | 0 | 11 |
| CAWR-14-86969 | Spring 1 | REG | SW-846:6850 | 0 | 1 |
| CAWR-14-87098 | Spring 2 | REG | SW-846:8011 | 0 | 2 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

October 28, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Groundwater Samples
Work Order: 357745
SDG: 2014-4642

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on October 01, 2014, and analyzed for Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2014-4642
Enclosures

**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Work Order #: 357745**
**SDG: 2014-4642**

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# Case Narrative

**Case Narrative for**
**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Workorder #: 357745**
**SDG # : 2014-4642**

**October 28, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on October 01, 2014 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 357745001 | CAWR-14-86942 |
| 357745002 | CAWR-14-86942 |
| 357745003 | CAWR-14-86942 |
| 357745004 | CAWR-14-86969 |
| 357745005 | CAWR-14-86892 |
| 357745006 | CAWR-14-86892 |
| 357745007 | CAWR-14-86892 |
| 357745008 | CAWR-14-86892 |
| 357745009 | CAWR-14-86915 |
| 357745010 | CAWR-14-86915 |
| 357745011 | CAWR-14-86943 |
| 357745012 | CAWR-14-86943 |
| 357745013 | CAWR-14-86916 |
| 357745014 | CAWR-14-86916 |
| 357745015 | CAWR-14-87098 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 28 October 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−14−9 |
| Utah NELAP | SC000122014−16 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

357745

ADEQ

COC/Lab Request #: 2014-4642

Page 1 of 1

Client Contact:

Lab Agreement # : 126310011

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8011-TB | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8151A-PCP | ~~WSP-LL-8260B~~ | ~~WSP-LL-8200B-TB~~ | ~~WSP-LL-8270C~~ | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | WSP-8260-TB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86942 | Sep 29 2014 | 10:21 | W | 1 | 2 | | 3 | 2 | | | | | 1 | | 1 | | 2 | | | | 1 | 1 | |
| CAWR-14-86969 | Sep 29 2014 | 10:21 | W | | | | | | | | | 1 | | 1 | | | | | | 1 | | | |
| CAWR-14-86892 | Sep 29 2014 | 10:21 | W | | | | | | 2 | 2 | 3 | | | | | 2 | | | | | | | |
| CAWR-14-86915 | Sep 29 2014 | 10:21 | W | | | 1 | | 2 | | | | | | | | | | 1 | | | | | 1 |
| CAWR-14-86943 | Sep 29 2014 | 12:20 | W | | | | | | | 2 | | | | | | 2 | | | 1 | | | | |
| CAWR-14-86916 | Sep 29 2014 | 12:20 | W | | | 1 | | | | | | | | | | | | 1 | | | | | 1 |
| CAWR-14-87098 | Sep 29 2014 | 12:20 | W | | 2 | | | | | | | | | | | | 2 | | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martinez | 9/30/14 3:40 | | H. Taylor | 10/1/14 0900 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| Client: LANL | SDG/AR/COC/Work Order: 7014-4642 |
| Received By: H. Taylor | Date Received: 100114 |

| Suspected Hazard Information | Yes | No | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | ✓ | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0CPM |
| Classified Radioactive II or III by RSO? | | ✓ | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | ✓ | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | ✓ | If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | ✓ | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | ✓ | |

| | Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | ✓ | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) 3-6 *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | ✓ | | | Temperature Device Serial #: 130532792 Secondary Temperature Device Serial # (If Applicable): |
| 3 | Chain of custody documents included with shipment? | ✓ | | | |
| 4 | Sample containers intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | ✓ | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | ✓ | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | ✓ | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | ✓ | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | ✓ | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | ✓ | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | | | ✓ | Sample ID's affected: see continuation |
| 12 | Are sample containers identifiable as GEL provided? | | | ✓ | |
| 13 | COC form is properly signed in relinquished/received sections? | ✓ | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other<br>5908 1777 8110-3 5908 1777 8153-5 received 100214<br>8164-3 8120-6<br>8186-4<br>8142-4 |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HT Date 100114 Page 1 of 2 GL-CHL-SR-001

GEL Laboratories LLC **SAMPLE RECEIPT & REVIEW CONTINUATION FORM**

Client: LANL Received By: H. Taylor Date Received: 100114 SDG/AR/COC/Work Order: 2014-4642

RN 2014-4645
*CAWR-14-86890, 86883, 86894, 86895, 86896 received 2 containers each for HEXP
*CAWR-14-86891 received 1 container each for PCP, SVOA and PAH

RN 2014-4642
*CAWR-14-86892, 86942 received 2 containers each for HEXP and PCB
*CAWR-14-86915 received 2 containers for VOA

PM (or PMA) review: Initials HT Date 100114 Page 2 of 2

**Subject:** Sample Receipt for 100114 and 100214
**From:** Hope Taylor <Hope.Taylor@gel.com>
**Date:** 10/2/2014 3:52 PM
**To:** "Keith R. Greene" <kgreene@lanl.gov>, LANL@amrad.com, "team.davis" <team.davis@gel.com>

**RN 2014-4642**
CAWR-14-86892 and 86942 received 2 containers each for HEXP and PCB
CAWR-14-86915 received 2 containers for 8260

**RN 2014-4645**
CAWR-14-86890, 86883, 86894, 86895 and 86896 received 2 containers each for HEXP
CAWR-14-86879 received 1 container each for PCP, SVOA and PAH

**RN 2015-8**
CAWR-14-86888, 86891, 86901 and 86898 received 2 containers each for HEXP

Thanks

--
Hope Taylor
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Direct: 843.769.7376 ext. 4778
Main: 843.556.8171
Fax: 843.766.1178
E-mail: hop01200@gel.com
Web: www.gel.com

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30SEP14
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 566-8171
REF: WE991158W100

3

FedEx Express

1 of 3

TRK# 0201 5908 1777 8110

## MASTER ##

WED - 01 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30SEP14
ACTWGT: 42.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 566-8171
REF: WE991158W100

3

FedEx Express

3 of 3

MPS# 0263 5908 1777 8164

Mstr# 5908 1777 8142 0201

WED - 01 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30SEP14
ACTWGT: 22.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

4

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

FedEx Express

2 of 2
MPS# 0263 5908 1777 8186
Mstr# 5908 1777 8175 0201

WED - 01 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30SEP14
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

4

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

FedEx Express

1 of 3
TRK# 0201 5908 1777 8142
## MASTER ##

WED - 01 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30SEP14
ACTWGT: 43.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

FedEx Express

3 of 3
MPS# 0263 5908 1777 8131
Mstr# 5908 1777 8110
0201

WED - 01 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 159148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30SEP14
ACTWGT: 44.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

4

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

FedEx Express

1 of 2
TRK# 0201 5908 1777 8175
## MASTER ##

WED - 01 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 159148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30SEP14
ACTWGT: 42.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

5

FedEx Express

2 of 3
MPS# 0263 5908 1777 8153
Mstr# 5908 1777 8142

0201

WED - 01 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30SEP14
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

6

FedEx Express

2 of 3
MPS# 0263 5908 1777 8120
Mstr# 5908 1777 8110

0201

WED - 01 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# Case Narrative

**ChemStation Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer** |
| Analytical Method: | SW846 8260B DOE-AL |
| Analytical Batch Number: | 1426455 |

## Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 357745010 | CAWR-14-86915 |
| 357745014 | CAWR-14-86916 |
| 1203185449 | Method Blank (MB) |
| 1203185450 | Laboratory Control Sample (LCS) |
| 1203185451 | 357956002(CAWR-14-86945) Post Spike (PS) |
| 1203185452 | 357956002(CAWR-14-86945) Post Spike Duplicate (PSD) |
| 1203185515 | Laboratory Control Sample (LCS) |
| 1203185516 | 357956002(CAWR-14-86945) Post Spike (PS) |
| 1203185517 | 357956002(CAWR-14-86945) Post Spike Duplicate (PSD) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

## Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates wereadded by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Blank (MB) Statement**
The blank analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Sample 357956002 was designated for spike analysis.

**Matrix Spike (PS) Recovery Statement**
The spike recoveries were within the required acceptance limits.

**Matrix Spike Duplicate (PSD) Recovery Statement**
The spike duplicate recoveries were within the required acceptance limits.

**Relative Percent Difference (RPD) Statement**
The RPDs between the matrix spike pair met the acceptance limits.

**Internal Standard (ISTD) Acceptance**
The internal standard responses in all client and quality control samples met the required acceptance criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Sample Preservation and Integrity**
All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-analyses were not required for samples in this SDG.

**Miscellaneous Information**

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

**Additional Comments**
Additional comments were not required for this SDG.

**Residual Chlorine**
Residual Chlorine was not detected in any of the samples in this SDG.

**System Configuration**

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|---|---|---|---|---|---|
| VOAA.I | Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler | HP7890A/HP5975C | DB-624 | J&W, 60m x 0.25mm x 1.4um | Trap 10 |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert  **Name: Erin Haubert**

**Date: 18 OCT 2014**  **Title: Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745003** | **Date Received:** | **10/01/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86942** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 14:44** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 14:44** | | | | |
| **Data File:** | **101014\AB510.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745003** | **Date Received:** | **10/01/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86942** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 14:44** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 14:44** | | | | |
| **Data File:** | **101014\AB510.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745003** | **Date Received:** | **10/01/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86942** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 14:44** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 14:44** | | | | |
| **Data File:** | **101014\AB510.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.8 | 50.0 | ug/L | 112 | (77%-123%) |
| Bromofluorobenzene | 53.0 | 50.0 | ug/L | 106 | (80%-120%) |
| Toluene-d8 | 51.5 | 50.0 | ug/L | 103 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745010** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86915** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 15:09** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 15:09** | | | | |
| **Data File:** | **101014\AB511.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745010** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86915** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 15:09** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 15:09** | | | | |
| **Data File:** | **101014\AB511.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745010** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86915** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 15:09** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 15:09** | | | | |
| **Data File:** | **101014\AB511.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.7 | 50.0 | ug/L | 111 | (77%-123%) |
| Bromofluorobenzene | 52.8 | 50.0 | ug/L | 106 | (80%-120%) |
| Toluene-d8 | 51.7 | 50.0 | ug/L | 103 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745014** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **8260** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86916** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 15:33** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 15:33** | | | | |
| **Data File:** | **101014\AB512.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745014** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **8260** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86916** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 15:33** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 15:33** | | | | |
| **Data File:** | **101014\AB512.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | J | 3.06 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745014** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **8260** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86916** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 15:33** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 15:33** | | | | |
| **Data File:** | **101014\AB512.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.3 | 50.0 | ug/L | 111 | (77%-123%) |
| Bromofluorobenzene | 52.8 | 50.0 | ug/L | 106 | (80%-120%) |
| Toluene-d8 | 50.7 | 50.0 | ug/L | 101 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Quality Control Summary

**Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-4642**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|---|---|---|---|---|
| 1203185450 | LCS for batch 1426455 | 112 | 102 | 104 |
| 1203185515 | LCS for batch 1426455 | 108 | 101 | 104 |
| 1203185449 | MB for batch 1426455 | 104 | 103 | 104 |
| 357745003 | CAWR-14-86942 | 112 | 103 | 106 |
| 357745010 | CAWR-14-86915 | 111 | 103 | 106 |
| 357745014 | CAWR-14-86916 | 111 | 101 | 106 |
| 1203185451 | CAWR-14-86945PS | 116 | 103 | 104 |
| 1203185452 | CAWR-14-86945PSD | 113 | 104 | 104 |
| 1203185516 | CAWR-14-86945PS | 110 | 101 | 106 |
| 1203185517 | CAWR-14-86945PSD | 111 | 101 | 107 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| DCED4 | = 1,2-Dichloroethane-d4 | (77%-123%) |
| TOL | = Toluene-d8 | (80%-120%) |
| BFB | = Bromofluorobenzene | (80%-120%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1426455**
**Lab Sample ID** **1203185450**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/10/2014 11:52**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 108 | 108 | 78-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 1250 | 100 | 60-124 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 312 | 125 | 55-147 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 276 | 110 | 72-126 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 278 | 111 | 73-135 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 290 | 116 | 61-133 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 297 | 119 | 57-145 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 279 | 112 | 67-128 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 286 | 115 | 59-147 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 58.7 | 117 | 52-134 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 46.0 | 92 | 57-126 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 50.5 | 101 | 62-126 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 42.1 | 84 | 63-127 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 53.1 | 106 | 69-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 57.5 | 115 | 69-129 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 54.7 | 109 | 72-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 56.6 | 113 | 70-127 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 50.9 | 102 | 70-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 54.8 | 110 | 74-120 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 54.4 | 109 | 73-120 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 53.8 | 108 | 75-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 53.2 | 106 | 76-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1426455**
**Lab Sample ID** **1203185450**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/10/2014 11:52**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 61.1 | 122 | 76-131 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 53.7 | 107 | 76-122 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 55.6 | 111 | 76-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 60.7 | 121 | 76-131 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 56.4 | 113 | 73-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 63.0 | 126 | 76-135 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 55.3 | 111 | 71-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 51.2 | 102 | 75-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 54.7 | 109 | 77-123 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 52.6 | 105 | 76-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 54.6 | 109 | 77-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 59.9 | 120 | 78-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 57.9 | 116 | 78-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 52.1 | 104 | 75-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 60.0 | 120 | 78-124 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 52.2 | 104 | 76-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 52.8 | 106 | 73-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 54.1 | 108 | 73-125 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 63.2 | 126 | 72-131 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 51.1 | 102 | 77-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 54.2 | 108 | 77-120 |
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 54.5 | 109 | 78-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1426455**
**Lab Sample ID** **1203185450**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/10/2014 11:52**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 58.4 | 117 | 79-124 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 65.6 | 131 | 65-132 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 56.5 | 113 | 76-123 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 52.2 | 104 | 72-122 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 54.0 | 108 | 71-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 52.7 | 105 | 76-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 54.8 | 110 | 75-121 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 55.7 | 111 | 77-122 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 53.5 | 107 | 76-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 53.9 | 108 | 76-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 55.5 | 111 | 77-127 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 55.8 | 112 | 77-121 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 55.5 | 111 | 77-124 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 56.5 | 113 | 77-126 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 52.0 | 104 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 51.0 | 102 | 76-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 56.2 | 112 | 76-127 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 55.7 | 111 | 69-133 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 55.3 | 111 | 67-129 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 53.7 | 107 | 66-131 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 54.0 | 108 | 68-132 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 58.1 | 116 | 80-126 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Sample Type:** **Laboratory Control Sample**
**Client ID:** **LCS for batch 1426455**
**Matrix:** **WATER**
**Lab Sample ID** **1203185450**
**Instrument:** **VOAA.I**
**Analysis Date:** **10/10/2014 11:52**
**Dilution: 1**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 51.3 | 103 | 77-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 5700 | 114 | 61-135 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PS**
**Lab Sample ID** **1203185451**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 20:27**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PS | m,p-Xylenes | 100 | 0.00 | U | 93.5 | 93 | 69-122 |
| 75-05-8 | PS | Acetonitrile | 1250 | 0.00 | U | 1230 | 98 | 54-130 |
| 67-64-1 | PS | Acetone | 250 | 3.39 | J | 144 | 56 | 27-155 |
| 74-88-4 | PS | Iodomethane | 250 | 0.00 | U | 251 | 100 | 69-128 |
| 75-15-0 | PS | Carbon disulfide | 250 | 0.00 | U | 250 | 100 | 68-138 |
| 108-05-4 | PS | Vinyl acetate | 250 | 0.00 | U | 227 | 91 | 50-137 |
| 78-93-3 | PS | 2-Butanone | 250 | 0.00 | U | 186 | 74 | 30-145 |
| 108-10-1 | PS | 4-Methyl-2-pentanone | 250 | 0.00 | U | 248 | 99 | 60-132 |
| 591-78-6 | PS | 2-Hexanone | 250 | 0.00 | U | 241 | 97 | 38-144 |
| 75-71-8 | PS | Dichlorodifluoromethane | 50.0 | 0.00 | U | 56.3 | 113 | 37-143 |
| 74-87-3 | PS | Chloromethane | 50.0 | 0.00 | U | 43.2 | 86 | 48-132 |
| 75-01-4 | PS | Vinyl chloride | 50.0 | 0.00 | U | 46.5 | 93 | 53-132 |
| 74-83-9 | PS | Bromomethane | 50.0 | 0.00 | U | 44.1 | 88 | 60-132 |
| 75-00-3 | PS | Chloroethane | 50.0 | 0.00 | U | 49.7 | 99 | 66-120 |
| 75-69-4 | PS | Trichlorofluoromethane | 50.0 | 0.00 | U | 55.5 | 111 | 64-131 |
| 60-29-7 | PS | Ethyl ether | 50.0 | 0.00 | U | 54.7 | 109 | 69-119 |
| 75-35-4 | PS | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 49.4 | 99 | 65-129 |
| 75-09-2 | PS | Methylene chloride | 50.0 | 2.76 | U | 50.5 | 96 | 68-119 |
| 1634-04-4 | PS | tert-Butyl methyl ether | 50.0 | 0.00 | U | 52.5 | 105 | 70-123 |
| 156-60-5 | PS | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 50.6 | 101 | 68-123 |
| 75-34-3 | PS | 1,1-Dichloroethane | 50.0 | 0.00 | U | 51.0 | 102 | 71-122 |
| 156-59-2 | PS | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 49.3 | 99 | 72-122 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PS**
**Lab Sample ID** **1203185451**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 20:27**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PS | 2,2-Dichloropropane | 50.0 | 0.00 | U | 55.2 | 110 | 69-131 |
| 74-97-5 | PS | Bromochloromethane | 50.0 | 0.00 | U | 51.4 | 103 | 74-123 |
| 67-66-3 | PS | Chloroform | 50.0 | 0.00 | U | 53.6 | 107 | 72-123 |
| 71-55-6 | PS | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 56.0 | 112 | 71-133 |
| 563-58-6 | PS | 1,1-Dichloropropene | 50.0 | 0.00 | U | 48.7 | 97 | 68-125 |
| 56-23-5 | PS | Carbon tetrachloride | 50.0 | 0.00 | U | 58.5 | 117 | 70-139 |
| 107-06-2 | PS | 1,2-Dichloroethane | 50.0 | 0.00 | U | 55.6 | 111 | 67-123 |
| 71-43-2 | PS | Benzene | 50.0 | 0.00 | U | 46.7 | 93 | 71-118 |
| 79-01-6 | PS | Trichloroethylene | 50.0 | 0.00 | U | 48.8 | 98 | 68-130 |
| 78-87-5 | PS | 1,2-Dichloropropane | 50.0 | 0.00 | U | 48.9 | 98 | 72-118 |
| 74-95-3 | PS | Dibromomethane | 50.0 | 0.00 | U | 52.8 | 106 | 74-122 |
| 75-27-4 | PS | Bromodichloromethane | 50.0 | 0.00 | U | 58.0 | 116 | 75-129 |
| 10061-01-5 | PS | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 51.5 | 103 | 73-125 |
| 108-88-3 | PS | Toluene | 50.0 | 0.00 | U | 47.0 | 94 | 69-119 |
| 10061-02-6 | PS | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 54.7 | 109 | 73-125 |
| 79-00-5 | PS | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 49.7 | 99 | 73-118 |
| 142-28-9 | PS | 1,3-Dichloropropane | 50.0 | 0.00 | U | 51.2 | 102 | 71-116 |
| 127-18-4 | PS | Tetrachloroethylene | 50.0 | 0.00 | U | 46.6 | 93 | 65-128 |
| 124-48-1 | PS | Dibromochloromethane | 50.0 | 0.00 | U | 62.2 | 124 | 68-133 |
| 108-90-7 | PS | Chlorobenzene | 50.0 | 0.00 | U | 46.2 | 92 | 71-119 |
| 100-41-4 | PS | Ethylbenzene | 50.0 | 0.00 | U | 47.7 | 95 | 70-121 |
| 95-47-6 | PS | o-Xylene | 50.0 | 0.00 | U | 48.8 | 98 | 70-123 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PS**
**Lab Sample ID** **1203185451**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 20:27**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 100-42-5 | PS | Styrene | 50.0 | 0.00 | U | 51.1 | 102 | 72-127 |
| 75-25-2 | PS | Bromoform | 50.0 | 0.00 | U | 60.2 | 120 | 60-133 |
| 98-82-8 | PS | Isopropylbenzene | 50.0 | 0.00 | U | 46.6 | 93 | 67-127 |
| 79-34-5 | PS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 50.0 | 100 | 67-125 |
| 96-18-4 | PS | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 52.5 | 105 | 68-123 |
| 108-86-1 | PS | Bromobenzene | 50.0 | 0.00 | U | 46.8 | 94 | 69-120 |
| 103-65-1 | PS | n-Propylbenzene | 50.0 | 0.00 | U | 43.0 | 86 | 65-125 |
| 108-67-8 | PS | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 46.8 | 94 | 67-126 |
| 95-49-8 | PS | 2-Chlorotoluene | 50.0 | 0.00 | U | 44.9 | 90 | 67-122 |
| 106-43-4 | PS | 4-Chlorotoluene | 50.0 | 0.00 | U | 45.5 | 91 | 66-121 |
| 98-06-6 | PS | tert-Butylbenzene | 50.0 | 0.00 | U | 45.9 | 92 | 67-130 |
| 95-63-6 | PS | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 45.3 | 91 | 66-124 |
| 135-98-8 | PS | sec-Butylbenzene | 50.0 | 0.00 | U | 44.6 | 89 | 67-128 |
| 99-87-6 | PS | 4-Isopropyltoluene | 50.0 | 0.00 | U | 44.1 | 88 | 66-129 |
| 541-73-1 | PS | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 44.1 | 88 | 67-120 |
| 106-46-7 | PS | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 42.4 | 85 | 66-118 |
| 104-51-8 | PS | n-Butylbenzene | 50.0 | 0.00 | U | 41.2 | 82 | 63-131 |
| 87-68-3 | PS | Hexachlorobutadiene | 50.0 | 0.00 | U | 40.3 | 81 | 55-138 |
| 91-20-3 | PS | Naphthalene | 50.0 | 0.00 | U | 49.0 | 98 | 61-131 |
| 87-61-6 | PS | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 44.2 | 88 | 56-133 |
| 120-82-1 | PS | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 41.3 | 83 | 56-131 |
| 630-20-6 | PS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 55.5 | 111 | 76-129 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PS**
**Lab Sample ID** **1203185451**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 20:27**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 95-50-1 | PS | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 44.9 | 90 | 69-119 |
| 71-36-3 | PS | n-Butyl alcohol | 5000 | 0.00 | U | 5220 | 104 | 55-141 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PSD**
**Lab Sample ID** **1203185452**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 20:52**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PSD | m,p-Xylenes | 100 | 0.00 | U | 94.5 | 95 | 69-122 | 1 | 0-20 |
| 75-05-8 | PSD | Acetonitrile | 1250 | 0.00 | U | 1250 | 100 | 54-130 | 2 | 0-20 |
| 67-64-1 | PSD | Acetone | 250 | 3.39 | J | 145 | 57 | 27-155 | 1 | 0-20 |
| 74-88-4 | PSD | Iodomethane | 250 | 0.00 | U | 252 | 101 | 69-128 | 0 | 0-20 |
| 75-15-0 | PSD | Carbon disulfide | 250 | 0.00 | U | 250 | 100 | 68-138 | 0 | 0-20 |
| 108-05-4 | PSD | Vinyl acetate | 250 | 0.00 | U | 230 | 92 | 50-137 | 2 | 0-20 |
| 78-93-3 | PSD | 2-Butanone | 250 | 0.00 | U | 191 | 76 | 30-145 | 3 | 0-20 |
| 108-10-1 | PSD | 4-Methyl-2-pentanone | 250 | 0.00 | U | 257 | 103 | 60-132 | 3 | 0-20 |
| 591-78-6 | PSD | 2-Hexanone | 250 | 0.00 | U | 245 | 98 | 38-144 | 2 | 0-20 |
| 75-71-8 | PSD | Dichlorodifluoromethane | 50.0 | 0.00 | U | 55.3 | 111 | 37-143 | 2 | 0-20 |
| 74-87-3 | PSD | Chloromethane | 50.0 | 0.00 | U | 45.2 | 90 | 48-132 | 5 | 0-20 |
| 75-01-4 | PSD | Vinyl chloride | 50.0 | 0.00 | U | 47.2 | 94 | 53-132 | 1 | 0-20 |
| 74-83-9 | PSD | Bromomethane | 50.0 | 0.00 | U | 44.4 | 89 | 60-132 | 1 | 0-20 |
| 75-00-3 | PSD | Chloroethane | 50.0 | 0.00 | U | 50.5 | 101 | 66-120 | 1 | 0-20 |
| 75-69-4 | PSD | Trichlorofluoromethane | 50.0 | 0.00 | U | 53.4 | 107 | 64-131 | 4 | 0-20 |
| 60-29-7 | PSD | Ethyl ether | 50.0 | 0.00 | U | 56.1 | 112 | 69-119 | 2 | 0-20 |
| 75-35-4 | PSD | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 48.6 | 97 | 65-129 | 2 | 0-20 |
| 75-09-2 | PSD | Methylene chloride | 50.0 | 2.76 | U | 50.8 | 96 | 68-119 | 1 | 0-20 |
| 1634-04-4 | PSD | tert-Butyl methyl ether | 50.0 | 0.00 | U | 53.7 | 107 | 70-123 | 2 | 0-20 |
| 156-60-5 | PSD | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 49.5 | 99 | 68-123 | 2 | 0-20 |
| 75-34-3 | PSD | 1,1-Dichloroethane | 50.0 | 0.00 | U | 50.3 | 101 | 71-122 | 1 | 0-20 |
| 156-59-2 | PSD | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 49.0 | 98 | 72-122 | 1 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PSD**
**Lab Sample ID** **1203185452**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 20:52**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PSD | 2,2-Dichloropropane | 50.0 | 0.00 | U | 54.1 | 108 | 69-131 | 2 | 0-20 |
| 74-97-5 | PSD | Bromochloromethane | 50.0 | 0.00 | U | 51.6 | 103 | 74-123 | 1 | 0-20 |
| 67-66-3 | PSD | Chloroform | 50.0 | 0.00 | U | 52.6 | 105 | 72-123 | 2 | 0-20 |
| 71-55-6 | PSD | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 54.6 | 109 | 71-133 | 3 | 0-20 |
| 563-58-6 | PSD | 1,1-Dichloropropene | 50.0 | 0.00 | U | 48.1 | 96 | 68-125 | 1 | 0-20 |
| 56-23-5 | PSD | Carbon tetrachloride | 50.0 | 0.00 | U | 56.7 | 113 | 70-139 | 3 | 0-20 |
| 107-06-2 | PSD | 1,2-Dichloroethane | 50.0 | 0.00 | U | 55.1 | 110 | 67-123 | 1 | 0-20 |
| 71-43-2 | PSD | Benzene | 50.0 | 0.00 | U | 46.6 | 93 | 71-118 | 0 | 0-20 |
| 79-01-6 | PSD | Trichloroethylene | 50.0 | 0.00 | U | 48.2 | 96 | 68-130 | 1 | 0-20 |
| 78-87-5 | PSD | 1,2-Dichloropropane | 50.0 | 0.00 | U | 49.6 | 99 | 72-118 | 1 | 0-20 |
| 74-95-3 | PSD | Dibromomethane | 50.0 | 0.00 | U | 53.1 | 106 | 74-122 | 1 | 0-20 |
| 75-27-4 | PSD | Bromodichloromethane | 50.0 | 0.00 | U | 57.7 | 115 | 75-129 | 0 | 0-20 |
| 10061-01-5 | PSD | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 52.2 | 104 | 73-125 | 1 | 0-20 |
| 108-88-3 | PSD | Toluene | 50.0 | 0.00 | U | 47.5 | 95 | 69-119 | 1 | 0-20 |
| 10061-02-6 | PSD | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 56.3 | 113 | 73-125 | 3 | 0-20 |
| 79-00-5 | PSD | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 50.8 | 102 | 73-118 | 2 | 0-20 |
| 142-28-9 | PSD | 1,3-Dichloropropane | 50.0 | 0.00 | U | 51.8 | 104 | 71-116 | 1 | 0-20 |
| 127-18-4 | PSD | Tetrachloroethylene | 50.0 | 0.00 | U | 46.5 | 93 | 65-128 | 0 | 0-20 |
| 124-48-1 | PSD | Dibromochloromethane | 50.0 | 0.00 | U | 63.2 | 126 | 68-133 | 2 | 0-20 |
| 108-90-7 | PSD | Chlorobenzene | 50.0 | 0.00 | U | 46.7 | 93 | 71-119 | 1 | 0-20 |
| 100-41-4 | PSD | Ethylbenzene | 50.0 | 0.00 | U | 48.1 | 96 | 70-121 | 1 | 0-20 |
| 95-47-6 | PSD | o-Xylene | 50.0 | 0.00 | U | 49.5 | 99 | 70-123 | 1 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PSD**
**Lab Sample ID** **1203185452**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 20:52**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 100-42-5 | PSD | Styrene | 50.0 | 0.00 | U | 51.5 | 103 | 72-127 | 1 | 0-20 |
| 75-25-2 | PSD | Bromoform | 50.0 | 0.00 | U | 62.3 | 125 | 60-133 | 3 | 0-20 |
| 98-82-8 | PSD | Isopropylbenzene | 50.0 | 0.00 | U | 47.8 | 96 | 67-127 | 3 | 0-20 |
| 79-34-5 | PSD | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 51.8 | 104 | 67-125 | 4 | 0-20 |
| 96-18-4 | PSD | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 53.0 | 106 | 68-123 | 1 | 0-20 |
| 108-86-1 | PSD | Bromobenzene | 50.0 | 0.00 | U | 48.1 | 96 | 69-120 | 3 | 0-20 |
| 103-65-1 | PSD | n-Propylbenzene | 50.0 | 0.00 | U | 44.3 | 89 | 65-125 | 3 | 0-20 |
| 108-67-8 | PSD | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 48.4 | 97 | 67-126 | 3 | 0-20 |
| 95-49-8 | PSD | 2-Chlorotoluene | 50.0 | 0.00 | U | 46.0 | 92 | 67-122 | 2 | 0-20 |
| 106-43-4 | PSD | 4-Chlorotoluene | 50.0 | 0.00 | U | 47.1 | 94 | 66-121 | 3 | 0-20 |
| 98-06-6 | PSD | tert-Butylbenzene | 50.0 | 0.00 | U | 47.9 | 96 | 67-130 | 4 | 0-20 |
| 95-63-6 | PSD | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 46.9 | 94 | 66-124 | 4 | 0-20 |
| 135-98-8 | PSD | sec-Butylbenzene | 50.0 | 0.00 | U | 46.7 | 93 | 67-128 | 5 | 0-20 |
| 99-87-6 | PSD | 4-Isopropyltoluene | 50.0 | 0.00 | U | 46.2 | 92 | 66-129 | 5 | 0-20 |
| 541-73-1 | PSD | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 45.6 | 91 | 67-120 | 3 | 0-20 |
| 106-46-7 | PSD | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 44.4 | 89 | 66-118 | 5 | 0-20 |
| 104-51-8 | PSD | n-Butylbenzene | 50.0 | 0.00 | U | 44.0 | 88 | 63-131 | 6 | 0-20 |
| 87-68-3 | PSD | Hexachlorobutadiene | 50.0 | 0.00 | U | 44.6 | 89 | 55-138 | 10 | 0-20 |
| 91-20-3 | PSD | Naphthalene | 50.0 | 0.00 | U | 52.6 | 105 | 61-131 | 7 | 0-20 |
| 87-61-6 | PSD | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 48.0 | 96 | 56-133 | 8 | 0-20 |
| 120-82-1 | PSD | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 44.6 | 89 | 56-131 | 8 | 0-20 |
| 630-20-6 | PSD | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 56.6 | 113 | 76-129 | 2 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PSD**
**Lab Sample ID** **1203185452**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 20:52**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-50-1 | PSD | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 46.9 | 94 | 69-119 | 4 | 0-20 |
| 71-36-3 | PSD | n-Butyl alcohol | 5000 | 0.00 | U | 5440 | 109 | 55-141 | 4 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1426455**
**Lab Sample ID** **1203185515**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/10/2014 13:29**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 276 | 111 | 61-132 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 267 | 107 | 67-139 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 236 | 94 | 64-124 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 244 | 97 | 68-123 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 247 | 99 | 69-128 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 263 | 105 | 66-124 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 266 | 106 | 73-123 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 263 | 105 | 75-122 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 2590 | 103 | 64-132 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 55.5 | 111 | 60-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PS**
**Lab Sample ID** **1203185516**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 21:16**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PS | Acrolein | 250 | 0.00 | U | 249 | 99 | 48-138 |
| 76-13-1 | PS | Trichlorotrifluoroethane | 250 | 0.00 | U | 260 | 104 | 63-146 |
| 107-05-1 | PS | Allyl chloride | 250 | 0.00 | U | 234 | 94 | 61-126 |
| 107-13-1 | PS | Acrylonitrile | 250 | 0.00 | U | 250 | 100 | 62-128 |
| 107-12-0 | PS | Propionitrile | 250 | 0.00 | U | 253 | 101 | 63-133 |
| 126-98-7 | PS | Methacrylonitrile | 250 | 0.00 | U | 272 | 109 | 61-131 |
| 80-62-6 | PS | Methyl methacrylate | 250 | 0.00 | U | 268 | 107 | 69-127 |
| 97-63-2 | PS | Ethyl methacrylate | 250 | 0.00 | U | 263 | 105 | 70-126 |
| 78-83-1 | PS | Isobutyl alcohol | 2500 | 0.00 | U | 2600 | 104 | 57-139 |
| 126-99-8 | PS | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 54.2 | 108 | 56-140 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86945PSD**
**Lab Sample ID** **1203185517**
**Instrument:** **VOAA.I**
**Analyst:** **JEB**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/10/2014 21:41**
**Dilution: 1**
**Batch ID:** **1426455**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PSD | Acrolein | 250 | 0.00 | U | 254 | 102 | 48-138 | 2 | 0-20 |
| 76-13-1 | PSD | Trichlorotrifluoroethane | 250 | 0.00 | U | 251 | 100 | 63-146 | 4 | 0-20 |
| 107-05-1 | PSD | Allyl chloride | 250 | 0.00 | U | 226 | 90 | 61-126 | 4 | 0-20 |
| 107-13-1 | PSD | Acrylonitrile | 250 | 0.00 | U | 245 | 98 | 62-128 | 2 | 0-20 |
| 107-12-0 | PSD | Propionitrile | 250 | 0.00 | U | 247 | 99 | 63-133 | 3 | 0-20 |
| 126-98-7 | PSD | Methacrylonitrile | 250 | 0.00 | U | 261 | 105 | 61-131 | 4 | 0-20 |
| 80-62-6 | PSD | Methyl methacrylate | 250 | 0.00 | U | 255 | 102 | 69-127 | 5 | 0-20 |
| 97-63-2 | PSD | Ethyl methacrylate | 250 | 0.00 | U | 249 | 100 | 70-126 | 6 | 0-20 |
| 78-83-1 | PSD | Isobutyl alcohol | 2500 | 0.00 | U | 2540 | 102 | 57-139 | 2 | 0-20 |
| 126-99-8 | PSD | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 51.2 | 102 | 56-140 | 6 | 0-20 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1426455** | **Instrument ID:** | **VOAA.I** | **Data File:** | **101014\AB508AR.D** |
| **Lab Sample ID:** | **1203185449** | **Prep Date:** | **10/10/2014 13:54** | **Analyzed:** | **10/10/14 13:54** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| | Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 01 | LCS for batch 1426455 | 1203185450 | 101014\AB503AR.D | 10/10/14 | 1152 |
| 02 | LCS for batch 1426455 | 1203185515 | 101014\AB507AR.D | 10/10/14 | 1329 |
| 03 | CAWR-14-86942 | 357745003 | 101014\AB510.D | 10/10/14 | 1444 |
| 04 | CAWR-14-86915 | 357745010 | 101014\AB511.D | 10/10/14 | 1509 |
| 05 | CAWR-14-86916 | 357745014 | 101014\AB512.D | 10/10/14 | 1533 |
| 06 | CAWR-14-86945PS | 1203185451 | 101014\AB524.D | 10/10/14 | 2027 |
| 07 | CAWR-14-86945PSD | 1203185452 | 101014\AB525.D | 10/10/14 | 2052 |
| 08 | CAWR-14-86945PS | 1203185516 | 101014\AB526.D | 10/10/14 | 2116 |
| 09 | CAWR-14-86945PSD | 1203185517 | 101014\AB527.D | 10/10/14 | 2141 |

# Quality Control Data

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185449** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 13:54** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 13:54** | | | | |
| **Data File:** | **101014\AB508AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185449** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 13:54** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 13:54** | | | | |
| **Data File:** | **101014\AB508AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185449** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 13:54** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 13:54** | | | | |
| **Data File:** | **101014\AB508AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.1 | 50.0 | ug/L | 104 | (77%-123%) |
| Bromofluorobenzene | 51.8 | 50.0 | ug/L | 104 | (80%-120%) |
| Toluene-d8 | 51.5 | 50.0 | ug/L | 103 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185450** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 11:52** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 11:52** | | | | |
| **Data File:** | **101014\AB503AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 58.1 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 60.7 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 52.2 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 52.2 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 53.8 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 56.6 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 56.4 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 53.7 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 54.0 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 54.0 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 55.8 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 51.3 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 55.3 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 52.6 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 55.7 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 52.0 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 52.8 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 51.0 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 61.1 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 297 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 53.5 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 286 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 53.9 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 56.5 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 279 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 312 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 1250 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 51.2 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 52.7 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 53.7 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 59.9 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 65.6 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 42.1 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 278 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185450** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 11:52** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 11:52** | | | | |
| **Data File:** | **101014\AB503AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 63.0 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 51.1 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 55.6 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 46.0 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 63.2 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 54.6 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 58.7 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 54.7 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 54.2 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 55.7 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 276 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 56.5 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 50.9 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 55.3 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 58.4 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 54.1 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 52.1 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 54.7 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 57.5 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 290 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 50.5 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 53.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 57.9 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 108 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 5700 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 56.2 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 54.8 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 54.5 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 55.5 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 54.8 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 55.5 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185450** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 11:52** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 11:52** | | | | |
| **Data File:** | **101014\AB503AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 54.4 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 60.0 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.8 | 50.0 | ug/L | 112 | (77%-123%) |
| Bromofluorobenzene | 51.8 | 50.0 | ug/L | 104 | (80%-120%) |
| Toluene-d8 | 50.9 | 50.0 | ug/L | 102 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185451** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 20:27** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 20:27** | | | | |
| **Data File:** | **101014\AB524.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 55.5 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 56.0 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 50.0 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 49.7 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 51.0 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 49.4 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 48.7 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 44.2 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 52.5 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 41.3 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 45.3 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 44.9 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 55.6 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 48.9 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 46.8 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 44.1 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 51.2 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 42.4 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 55.2 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 186 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 44.9 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 241 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 45.5 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 44.1 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 248 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 144 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 1230 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 46.7 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 46.8 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 51.4 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 58.0 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 60.2 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 44.1 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 250 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185451** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 20:27** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 20:27** | | | | |
| **Data File:** | **101014\AB524.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 58.5 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 46.2 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 49.7 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 53.6 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 43.2 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 62.2 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 52.8 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 56.3 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 54.7 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 47.7 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 40.3 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 251 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 46.6 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 50.5 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 49.0 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 51.1 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 46.6 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 47.0 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 48.8 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 55.5 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 227 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 46.5 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 49.3 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 51.5 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 93.5 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 5220 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 41.2 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 43.0 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 48.8 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 44.6 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 52.5 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 45.9 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185451** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 20:27** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 20:27** | | | | |
| **Data File:** | **101014\AB524.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 50.6 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 54.7 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 58.2 | 50.0 | ug/L | 116 | (77%-123%) |
| Bromofluorobenzene | 52.1 | 50.0 | ug/L | 104 | (80%-120%) |
| Toluene-d8 | 51.6 | 50.0 | ug/L | 103 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185452** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 20:52** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 20:52** | | | | |
| **Data File:** | **101014\AB525.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 56.6 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 54.6 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 51.8 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 50.8 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 50.3 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 48.6 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 48.1 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 48.0 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 53.0 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 44.6 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 46.9 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 46.9 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 55.1 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 49.6 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 48.4 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 45.6 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 51.8 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 44.4 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 54.1 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 191 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 46.0 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 245 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 47.1 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 46.2 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 257 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 145 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | | 1250 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 46.6 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 48.1 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 51.6 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 57.7 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 62.3 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 44.4 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 250 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185452** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 20:52** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 20:52** | | | | |
| **Data File:** | **101014\AB525.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 56.7 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 46.7 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 50.5 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 52.6 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 45.2 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 63.2 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 55.3 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 56.1 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 48.1 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 44.6 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 252 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 47.8 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 50.8 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 52.6 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 51.5 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 46.5 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 47.5 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 48.2 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 53.4 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 230 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 47.2 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 49.0 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 52.2 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 94.5 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 5440 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 44.0 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 44.3 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 49.5 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 46.7 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 53.7 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 47.9 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185452** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 20:52** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 20:52** | | | | |
| **Data File:** | **101014\AB525.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 49.5 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 56.3 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 56.6 | 50.0 | ug/L | 113 | (77%-123%) |
| Bromofluorobenzene | 52.1 | 50.0 | ug/L | 104 | (80%-120%) |
| Toluene-d8 | 51.9 | 50.0 | ug/L | 104 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185515** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 13:29** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 13:29** | | | | |
| **Data File:** | **101014\AB507AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 55.5 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 276 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 244 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 236 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185515** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 13:29** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 13:29** | | | | |
| **Data File:** | **101014\AB507AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 263 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2590 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 263 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 266 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 247 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 267 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185515** | | | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1426455** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 13:29** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 13:29** | | | | |
| **Data File:** | **101014\AB507AR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.8 | 50.0 | ug/L | 108 | (77%-123%) |
| Bromofluorobenzene | 52.1 | 50.0 | ug/L | 104 | (80%-120%) |
| Toluene-d8 | 50.4 | 50.0 | ug/L | 101 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185516** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 21:16** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 21:16** | | | | |
| **Data File:** | **101014\AB526.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 54.2 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 249 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 250 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 234 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185516** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 21:16** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 21:16** | | | | |
| **Data File:** | **101014\AB526.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 263 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2600 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 272 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 268 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 253 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 260 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185516** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 21:16** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 21:16** | | | | |
| **Data File:** | **101014\AB526.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.2 | 50.0 | ug/L | 110 | (77%-123%) |
| Bromofluorobenzene | 53.1 | 50.0 | ug/L | 106 | (80%-120%) |
| Toluene-d8 | 50.3 | 50.0 | ug/L | 101 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185517** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 21:41** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 21:41** | | | | |
| **Data File:** | **101014\AB527.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 51.2 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 254 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 245 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | | 226 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185517** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 21:41** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 21:41** | | | | |
| **Data File:** | **101014\AB527.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 249 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2540 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 261 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 255 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | | 247 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 251 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185517** | **Date Received:** | **10/03/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1426455** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86945PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1426455** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/10/2014 21:41** | **Analyst:** | **JEB** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/10/2014 21:41** | | | | |
| **Data File:** | **101014\AB527.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.7 | 50.0 | ug/L | 111 | (77%-123%) |
| Bromofluorobenzene | 53.6 | 50.0 | ug/L | 107 | (80%-120%) |
| Toluene-d8 | 50.5 | 50.0 | ug/L | 101 | (80%-120%) |

# Semi-Volatile Analysis

# Case Narrative

**Semi-Volatile Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry** |
| Analytical Method: | SW846 3510C/8270D |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1423498 |
| Prep Batch Number: | 1423494 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

| Sample ID | Client ID |
|---|---|
| 357745005 | CAWR-14-86892 |
| 1203178175 | MB for batch 1423494 |
| 1203178176 | Laboratory Control Sample (LCS) |
| 1203178177 | 357742001(CAWR-14-86890) Matrix Spike (MS) |
| 1203178179 | 357742001(CAWR-14-86890) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 33.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at

GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

**CCV Requirements**
All associated calibration verification standard (ICV or CCV) met the 8270D method acceptance criteria for this SDG.

Please note that sample 357745005 (CAWR-14-86892) in this batch was extracted and analyzed with samples that required the 8270C method. The 8270C method has tighter criteria for ICV %Drift, where the max %Drift is 20%. All target analytes requested by this SDG met the 8270D %Drift criteria of 30% for the ICVs. Due to software limitations, the Continuing Calibration Summary forms (Form 07) for the sample in this SDG displayed the Maximum Drift for the Method 8270C, not for Method 8270D, for the ICVs.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG in this batch met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Sample 357742001 (CAWR-14-86890) was selected for analysis as the matrix spike and matrix spike duplicate.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The relative percent difference between MS (1203178177) and MSD (1203178179) did not meet 0.0%-30.0% limits for Benzidine at 68.9 The individual spike recoveries were within the acceptance limits in the MS/MSD. The RPD failure has no adverse impact on the data and the results are reported for sample 357745005 (CAWR-14-86892).

**Internal Standard (ISTD) Acceptance**
The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1340455.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for 1203178175(MB) and sample 357745005 (CAWR-14-86892) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| MSD4.I | Agilent 7890A/5975C GC/MS w/ 7683 Autosampler | HP6890/HP5973 | DB-5MS | 25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 27 OCT 2014**  **Title: Data Validator**

# Sample Data Summary

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745005** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **SVOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86892** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 01:24** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **880 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0524.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 122-66-7 | Azobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 123-91-1 | 1,4-Dioxane | U | 11.4 | ug/L | 3.41 | 11.4 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 120-83-2 | 2,4-Dichlorophenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 105-67-9 | 2,4-Dimethylphenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 51-28-5 | 2,4-Dinitrophenol | U | 22.7 | ug/L | 5.68 | 22.7 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.14 | ug/L | 0.466 | 1.14 |
| 95-57-8 | 2-Chlorophenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 88-75-5 | 2-Nitrophenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 11.4 | ug/L | 3.41 | 11.4 |
| 101-55-3 | 4-Bromophenylphenylether | U | 11.4 | ug/L | 3.41 | 11.4 |
| 59-50-7 | Parachlorometa cresol | U | 11.4 | ug/L | 3.41 | 11.4 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 11.4 | ug/L | 3.75 | 11.4 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 11.4 | ug/L | 3.41 | 11.4 |
| 100-02-7 | 4-Nitrophenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 62-53-3 | Aniline | U | 11.4 | ug/L | 4.77 | 11.4 |
| 1912-24-9 | Atrazine | U | 11.4 | ug/L | 3.41 | 11.4 |
| 92-87-5 | Benzidine | U | 11.4 | ug/L | 4.43 | 11.4 |
| 65-85-0 | Benzoic acid | U | 22.7 | ug/L | 6.82 | 22.7 |
| 100-51-6 | Benzyl alcohol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 85-68-7 | Butylbenzylphthalate | U | 11.4 | ug/L | 3.41 | 11.4 |
| 84-74-2 | Di-n-butylphthalate | U | 11.4 | ug/L | 3.41 | 11.4 |
| 117-84-0 | Di-n-octylphthalate | U | 11.4 | ug/L | 3.41 | 11.4 |
| 132-64-9 | Dibenzofuran | U | 11.4 | ug/L | 3.41 | 11.4 |
| 84-66-2 | Diethylphthalate | U | 11.4 | ug/L | 3.41 | 11.4 |
| 131-11-3 | Dimethylphthalate | U | 11.4 | ug/L | 3.41 | 11.4 |
| 88-85-7 | Dinoseb | U | 11.4 | ug/L | 3.41 | 11.4 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745005** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **SVOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86892** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 01:24** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **880 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0524.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 11.4 | ug/L | 3.41 | 11.4 |
| 118-74-1 | Hexachlorobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 87-68-3 | Hexachlorobutadiene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 67-72-1 | Hexachloroethane | U | 11.4 | ug/L | 3.41 | 11.4 |
| 78-59-1 | Isophorone | U | 11.4 | ug/L | 3.98 | 11.4 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 11.4 | ug/L | 3.41 | 11.4 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 11.4 | ug/L | 3.41 | 11.4 |
| 55-18-5 | N-Nitrosodiethylamine | U | 11.4 | ug/L | 3.41 | 11.4 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 11.4 | ug/L | 3.41 | 11.4 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 11.4 | ug/L | 3.41 | 11.4 |
| 98-95-3 | Nitrobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 608-93-5 | Pentachlorobenzene | U | 11.4 | ug/L | 3.41 | 11.4 |
| 108-95-2 | Phenol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 110-86-1 | Pyridine | U | 11.4 | ug/L | 3.41 | 11.4 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 11.4 | ug/L | 3.41 | 11.4 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 11.4 | ug/L | 3.41 | 11.4 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 11.4 | ug/L | 3.41 | 11.4 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 11.4 | ug/L | 3.41 | 11.4 |
| 65794-96-9 | m,p-Cresols | U | 11.4 | ug/L | 4.20 | 11.4 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 11.4 | ug/L | 3.41 | 11.4 |
| 95-48-7 | o-Cresol | U | 11.4 | ug/L | 3.41 | 11.4 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 11.4 | ug/L | 3.41 | 11.4 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 11.4 | ug/L | 3.41 | 11.4 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 93.1 | 114 | ug/L | 82.0 | (33%-126%) |
| 2-Fluorobiphenyl | 38.8 | 56.8 | ug/L | 68.3 | (35%-102%) |
| 2-Fluorophenol | 50.1 | 114 | ug/L | 44.1 | (18%-84%) |
| Nitrobenzene-d5 | 38.4 | 56.8 | ug/L | 67.7 | (38%-113%) |
| Phenol-d5 | 31.6 | 114 | ug/L | 27.8 | (10%-110%) |
| p-Terphenyl-d14 | 41.1 | 56.8 | ug/L | 72.3 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Quality Control Summary

**Semi-Volatile**

## Surrogate Recovery Report

**SDG Number: 2014-4642**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 2FP %REC | PHL %REC | NBZ %REC | FBP %REC | TBP %REC | TPH %REC |
|---|---|---|---|---|---|---|---|
| 1203178175 | MB for batch 1423494 | 53 | 32 | 80 | 77 | 89 | 89 |
| 1203178176 | LCS for batch 1423494 | 52 | 33 | 82 | 80 | 91 | 83 |
| 1203178177 | CAWR-14-86890MS | 67 | 55 | 76 | 75 | 91 | 75 |
| 1203178179 | CAWR-14-86890MSD | 69 | 56 | 82 | 80 | 95 | 81 |
| 357745005 | CAWR-14-86892 | 44 | 28 | 68 | 68 | 82 | 72 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 2FP | = 2-Fluorophenol | (18%-84%) |
| PHL | = Phenol-d5 | (10%-110%) |
| NBZ | = Nitrobenzene-d5 | (38%-113%) |
| FBP | = 2-Fluorobiphenyl | (35%-102%) |
| TBP | = 2,4,6-Tribromophenol | (33%-126%) |
| TPH | = p-Terphenyl-d14 | (38%-123%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1423494**
**Lab Sample ID** **1203178176**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/05/2014 16:33**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 62-75-9 | LCS | N-Methyl-N-nitrosomethylam | 50.0 | 0.0 | 30.7 | 61 | 24-82 |
| 110-86-1 | LCS | Pyridine | 50.0 | 0.0 | 36.6 | 73 | 24-97 |
| 62-53-3 | LCS | Aniline | 50.0 | 0.0 | 45.9 | 92 | 42-120 |
| 108-95-2 | LCS | Phenol | 50.0 | 0.0 | 16.9 | 34 | 10-114 |
| 111-44-4 | LCS | bis(2-Chloroethyl) ether | 50.0 | 0.0 | 39.2 | 78 | 44-111 |
| 95-57-8 | LCS | 2-Chlorophenol | 50.0 | 0.0 | 38.3 | 77 | 44-103 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 26.6 | 53 | 27-91 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 28.0 | 56 | 27-93 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 28.2 | 56 | 29-92 |
| 108-60-1 | LCS | bis(2-Chloro-1-methylethyl)et | 50.0 | 0.0 | 35.7 | 71 | 30-113 |
| 100-51-6 | LCS | Benzyl alcohol | 50.0 | 0.0 | 35.7 | 71 | 34-106 |
| 95-48-7 | LCS | o-Cresol | 50.0 | 0.0 | 34.3 | 69 | 36-99 |
| 65794-96-9 | LCS | m,p-Cresols | 50.0 | 0.0 | 35.2 | 70 | 34-106 |
| 621-64-7 | LCS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 50.0 | 0.0 | 42.2 | 84 | 48-119 |
| 67-72-1 | LCS | Hexachloroethane | 50.0 | 0.0 | 25.3 | 51 | 25-92 |
| 98-95-3 | LCS | Nitrobenzene | 50.0 | 0.0 | 39.3 | 79 | 44-117 |
| 78-59-1 | LCS | Isophorone | 50.0 | 0.0 | 40.6 | 81 | 49-124 |
| 88-75-5 | LCS | 2-Nitrophenol | 50.0 | 0.0 | 43.0 | 86 | 47-110 |
| 105-67-9 | LCS | 2,4-Dimethylphenol | 50.0 | 0.0 | 37.9 | 76 | 43-105 |
| 111-91-1 | LCS | bis(2-Chloroethoxy)methane | 50.0 | 0.0 | 40.5 | 81 | 48-114 |
| 120-83-2 | LCS | 2,4-Dichlorophenol | 50.0 | 0.0 | 39.3 | 79 | 47-107 |
| 65-85-0 | LCS | Benzoic acid | 100 | 0.0 | 39.3 | 39 | 10-91 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1423494**
**Lab Sample ID** **1203178176**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/05/2014 16:33**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-47-8 | LCS | 4-Chloroaniline | 50.0 | 0.0 | 45.1 | 90 | 48-120 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 25.7 | 51 | 24-93 |
| 59-50-7 | LCS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 50.0 | 0.0 | 39.3 | 79 | 47-113 |
| 77-47-4 | LCS | Hexachlorocyclopentadiene | 50.0 | 0.0 | 26.6 | 53 | 18-87 |
| 88-06-2 | LCS | 2,4,6-Trichlorophenol | 50.0 | 0.0 | 44.1 | 88 | 48-114 |
| 95-95-4 | LCS | 2,4,5-Trichlorophenol | 50.0 | 0.0 | 41.6 | 83 | 50-113 |
| 91-58-7 | LCS | 2-Chloronaphthalene | 50.0 | 0.0 | 32.8 | 66 | 37-100 |
| 88-74-4 | LCS | 2-Nitroaniline<br>*o-Nitroaniline* | 50.0 | 0.0 | 46.1 | 92 | 50-123 |
| 99-09-2 | LCS | 3-Nitroaniline<br>*m-Nitroaniline* | 50.0 | 0.0 | 47.1 | 94 | 48-126 |
| 131-11-3 | LCS | Dimethylphthalate | 50.0 | 0.0 | 43.0 | 86 | 55-119 |
| 606-20-2 | LCS | 2,6-Dinitrotoluene | 50.0 | 0.0 | 41.2 | 82 | 55-117 |
| 121-14-2 | LCS | 2,4-Dinitrotoluene | 50.0 | 0.0 | 43.9 | 88 | 55-123 |
| 51-28-5 | LCS | 2,4-Dinitrophenol | 50.0 | 0.0 | 48.3 | 97 | 14-126 |
| 132-64-9 | LCS | Dibenzofuran | 50.0 | 0.0 | 39.0 | 78 | 46-111 |
| 58-90-2 | LCS | 2,3,4,6-Tetrachlorophenol | 50.0 | 0.0 | 45.4 | 91 | 48-117 |
| 84-66-2 | LCS | Diethylphthalate | 50.0 | 0.0 | 39.3 | 79 | 55-121 |
| 100-02-7 | LCS | 4-Nitrophenol | 50.0 | 0.0 | 15.4 | 31 | 15-109 |
| 7005-72-3 | LCS | 4-Chlorophenylphenylether | 50.0 | 0.0 | 38.0 | 76 | 44-112 |
| 100-01-6 | LCS | 4-Nitroaniline<br>*p-Nitroaniline* | 50.0 | 0.0 | 50.0 | 100 | 46-144 |
| 534-52-1 | LCS | 2-Methyl-4,6-dinitrophenol | 50.0 | 0.0 | 47.3 | 95 | 41-123 |
| 122-39-4 | LCS | Diphenylamine | 50.0 | 0.0 | 45.0 | 90 | 51-111 |
| 122-66-7 | LCS | Azobenzene<br>*1,2-Diphenylhydrazine* | 50.0 | 0.0 | 40.5 | 81 | 43-114 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1423494**
**Lab Sample ID** **1203178176**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/05/2014 16:33**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 101-55-3 | LCS | 4-Bromophenylphenylether | 50.0 | 0.0 | 40.2 | 80 | 46-112 |
| 118-74-1 | LCS | Hexachlorobenzene | 50.0 | 0.0 | 40.0 | 80 | 46-113 |
| 84-74-2 | LCS | Di-n-butylphthalate | 50.0 | 0.0 | 42.6 | 85 | 52-119 |
| 85-68-7 | LCS | Butylbenzylphthalate | 50.0 | 0.0 | 44.1 | 88 | 45-121 |
| 117-81-7 | LCS | bis(2-Ethylhexyl)phthalate | 50.0 | 0.0 | 41.9 | 84 | 43-120 |
| 117-84-0 | LCS | Di-n-octylphthalate | 50.0 | 0.0 | 39.2 | 78 | 40-122 |
| 123-91-1 | LCS | 1,4-Dioxane | 50.0 | 0.0 | 26.3 | 53 | 29-74 |
| 930-55-2 | LCS | N-Nitrosopyrrolidine | 50.0 | 0.0 | 44.5 | 89 | 46-111 |
| 95-94-3 | LCS | 1,2,4,5-Tetrachlorobenzene | 50.0 | 0.0 | 28.1 | 56 | 33-94 |
| 1912-24-9 | LCS | Atrazine | 50.0 | 0.0 | 45.1 | 90 | 30-122 |
| 92-87-5 | LCS | Benzidine | 100 | 0.0 | 67.0 | 67 | 10-137 |
| 91-94-1 | LCS | 3,3'-Dichlorobenzidine | 50.0 | 0.0 | 40.1 | 80 | 37-119 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 28.5 | 57 | 29-93 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86890MS**
**Lab Sample ID** **1203178177**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/05/2014 21:21**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MS | N-Methyl-N-nitrosomethylam | 125 | 0.00 | U | 97.9 | 78 | 26-97 |
| 110-86-1 | MS | Pyridine | 125 | 0.00 | U | 86.3 | 69 | 20-112 |
| 62-53-3 | MS | Aniline | 125 | 0.00 | U | 110 | 88 | 28-126 |
| 108-95-2 | MS | Phenol | 125 | 0.00 | U | 72.3 | 58 | 17-77 |
| 111-44-4 | MS | bis(2-Chloroethyl) ether | 125 | 0.00 | U | 92.7 | 74 | 37-113 |
| 95-57-8 | MS | 2-Chlorophenol | 125 | 0.00 | U | 92.1 | 74 | 34-108 |
| 541-73-1 | MS | 1,3-Dichlorobenzene | 125 | 0.00 | U | 69.8 | 56 | 25-89 |
| 106-46-7 | MS | 1,4-Dichlorobenzene | 125 | 0.00 | U | 74.5 | 60 | 26-90 |
| 95-50-1 | MS | 1,2-Dichlorobenzene | 125 | 0.00 | U | 75.1 | 60 | 26-92 |
| 108-60-1 | MS | bis(2-Chloro-1-methylethyl)et | 125 | 0.00 | U | 87.5 | 70 | 26-114 |
| 100-51-6 | MS | Benzyl alcohol | 125 | 0.00 | U | 103 | 83 | 28-119 |
| 95-48-7 | MS | o-Cresol | 125 | 0.00 | U | 92.1 | 74 | 30-108 |
| 65794-96-9 | MS | m,p-Cresols | 125 | 0.00 | U | 101 | 81 | 31-119 |
| 621-64-7 | MS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 125 | 0.00 | U | 101 | 81 | 40-122 |
| 67-72-1 | MS | Hexachloroethane | 125 | 0.00 | U | 66.2 | 53 | 23-89 |
| 98-95-3 | MS | Nitrobenzene | 125 | 0.00 | U | 94.8 | 76 | 38-123 |
| 78-59-1 | MS | Isophorone | 125 | 0.00 | U | 99.7 | 80 | 40-127 |
| 88-75-5 | MS | 2-Nitrophenol | 125 | 0.00 | U | 103 | 83 | 35-116 |
| 105-67-9 | MS | 2,4-Dimethylphenol | 125 | 0.00 | U | 93.7 | 75 | 34-109 |
| 111-91-1 | MS | bis(2-Chloroethoxy)methane | 125 | 0.00 | U | 98.8 | 79 | 41-116 |
| 120-83-2 | MS | 2,4-Dichlorophenol | 125 | 0.00 | U | 97.9 | 78 | 35-113 |
| 65-85-0 | MS | Benzoic acid | 250 | 0.00 | U | 166 | 66 | 12-94 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86890MS**
**Lab Sample ID** **1203178177**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/05/2014 21:21**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MS | 4-Chloroaniline | 125 | 0.00 | U | 105 | 84 | 32-122 |
| 87-68-3 | MS | Hexachlorobutadiene | 125 | 0.00 | U | 67.9 | 54 | 23-90 |
| 59-50-7 | MS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 125 | 0.00 | U | 101 | 81 | 37-119 |
| 77-47-4 | MS | Hexachlorocyclopentadiene | 125 | 0.00 | U | 66.2 | 53 | 10-84 |
| 88-06-2 | MS | 2,4,6-Trichlorophenol | 125 | 0.00 | U | 108 | 86 | 36-120 |
| 95-95-4 | MS | 2,4,5-Trichlorophenol | 125 | 0.00 | U | 106 | 85 | 37-121 |
| 91-58-7 | MS | 2-Chloronaphthalene | 125 | 0.00 | U | 90.8 | 73 | 32-103 |
| 88-74-4 | MS | 2-Nitroaniline<br>*o-Nitroaniline* | 125 | 0.00 | U | 110 | 88 | 38-126 |
| 99-09-2 | MS | 3-Nitroaniline<br>*m-Nitroaniline* | 125 | 0.00 | U | 114 | 91 | 30-131 |
| 131-11-3 | MS | Dimethylphthalate | 125 | 0.00 | U | 104 | 83 | 45-121 |
| 606-20-2 | MS | 2,6-Dinitrotoluene | 125 | 0.00 | U | 102 | 81 | 44-120 |
| 121-14-2 | MS | 2,4-Dinitrotoluene | 125 | 0.00 | U | 109 | 87 | 44-127 |
| 51-28-5 | MS | 2,4-Dinitrophenol | 125 | 0.00 | U | 101 | 81 | 10-133 |
| 132-64-9 | MS | Dibenzofuran | 125 | 0.00 | U | 106 | 85 | 39-114 |
| 58-90-2 | MS | 2,3,4,6-Tetrachlorophenol | 125 | 0.00 | U | 112 | 90 | 34-125 |
| 84-66-2 | MS | Diethylphthalate | 125 | 0.00 | U | 99.9 | 80 | 44-124 |
| 100-02-7 | MS | 4-Nitrophenol | 125 | 0.00 | U | 62.7 | 50 | 10-83 |
| 7005-72-3 | MS | 4-Chlorophenylphenylether | 125 | 0.00 | U | 108 | 86 | 37-112 |
| 100-01-6 | MS | 4-Nitroaniline<br>*p-Nitroaniline* | 125 | 0.00 | U | 128 | 102 | 27-149 |
| 534-52-1 | MS | 2-Methyl-4,6-dinitrophenol | 125 | 0.00 | U | 97.3 | 78 | 28-131 |
| 122-39-4 | MS | Diphenylamine | 125 | 0.00 | U | 105 | 84 | 34-117 |
| 122-66-7 | MS | Azobenzene<br>*1,2-Diphenylhydrazine* | 125 | 0.00 | U | 97.0 | 78 | 36-115 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86890MS**
**Lab Sample ID** **1203178177**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/05/2014 21:21**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MS | 4-Bromophenylphenylether | 125 | 0.00 | U | 101 | 81 | 39-112 |
| 118-74-1 | MS | Hexachlorobenzene | 125 | 0.00 | U | 98.1 | 78 | 39-114 |
| 84-74-2 | MS | Di-n-butylphthalate | 125 | 0.00 | U | 105 | 84 | 40-122 |
| 85-68-7 | MS | Butylbenzylphthalate | 125 | 0.00 | U | 99.6 | 80 | 36-124 |
| 117-81-7 | MS | bis(2-Ethylhexyl)phthalate | 125 | 0.00 | U | 100 | 80 | 35-123 |
| 117-84-0 | MS | Di-n-octylphthalate | 125 | 0.00 | U | 98.5 | 79 | 32-124 |
| 123-91-1 | MS | 1,4-Dioxane | 125 | 0.00 | U | 84.9 | 68 | 27-94 |
| 930-55-2 | MS | N-Nitrosopyrrolidine | 125 | 0.00 | U | 115 | 92 | 43-117 |
| 95-94-3 | MS | 1,2,4,5-Tetrachlorobenzene | 125 | 0.00 | U | 79.7 | 64 | 28-96 |
| 1912-24-9 | MS | Atrazine | 125 | 0.00 | U | 109 | 88 | 18-119 |
| 92-87-5 | MS | Benzidine | 250 | 0.00 | U | 73.1 | 29 | 10-127 |
| 91-94-1 | MS | 3,3'-Dichlorobenzidine | 125 | 0.00 | U | 90.7 | 73 | 19-120 |
| 120-82-1 | MS | 1,2,4-Trichlorobenzene | 125 | 0.00 | U | 77.1 | 62 | 26-92 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86890MSD**
**Lab Sample ID** **1203178179**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/05/2014 21:54**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MSD | N-Methyl-N-nitrosomethylam | 125 | 0.00 | U | 99.3 | 79 | 26-97 | 1 | 0-30 |
| 110-86-1 | MSD | Pyridine | 125 | 0.00 | U | 113 | 91 | 20-112 | 27 | 0-30 |
| 62-53-3 | MSD | Aniline | 125 | 0.00 | U | 118 | 94 | 28-126 | 7 | 0-30 |
| 108-95-2 | MSD | Phenol | 125 | 0.00 | U | 72.4 | 58 | 17-77 | 0 | 0-30 |
| 111-44-4 | MSD | bis(2-Chloroethyl) ether | 125 | 0.00 | U | 97.1 | 78 | 37-113 | 5 | 0-30 |
| 95-57-8 | MSD | 2-Chlorophenol | 125 | 0.00 | U | 97.9 | 78 | 34-108 | 6 | 0-30 |
| 541-73-1 | MSD | 1,3-Dichlorobenzene | 125 | 0.00 | U | 70.7 | 57 | 25-89 | 1 | 0-30 |
| 106-46-7 | MSD | 1,4-Dichlorobenzene | 125 | 0.00 | U | 76.2 | 61 | 26-90 | 2 | 0-30 |
| 95-50-1 | MSD | 1,2-Dichlorobenzene | 125 | 0.00 | U | 76.9 | 61 | 26-92 | 2 | 0-30 |
| 108-60-1 | MSD | bis(2-Chloro-1-methylethyl)et | 125 | 0.00 | U | 91.2 | 73 | 26-114 | 4 | 0-30 |
| 100-51-6 | MSD | Benzyl alcohol | 125 | 0.00 | U | 106 | 85 | 28-119 | 3 | 0-30 |
| 95-48-7 | MSD | o-Cresol | 125 | 0.00 | U | 96.3 | 77 | 30-108 | 5 | 0-30 |
| 65794-96-9 | MSD | m,p-Cresols | 125 | 0.00 | U | 105 | 84 | 31-119 | 4 | 0-30 |
| 621-64-7 | MSD | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 125 | 0.00 | U | 108 | 86 | 40-122 | 7 | 0-30 |
| 67-72-1 | MSD | Hexachloroethane | 125 | 0.00 | U | 67.3 | 54 | 23-89 | 2 | 0-30 |
| 98-95-3 | MSD | Nitrobenzene | 125 | 0.00 | U | 98.9 | 79 | 38-123 | 4 | 0-30 |
| 78-59-1 | MSD | Isophorone | 125 | 0.00 | U | 102 | 82 | 40-127 | 3 | 0-30 |
| 88-75-5 | MSD | 2-Nitrophenol | 125 | 0.00 | U | 109 | 87 | 35-116 | 5 | 0-30 |
| 105-67-9 | MSD | 2,4-Dimethylphenol | 125 | 0.00 | U | 98.0 | 78 | 34-109 | 4 | 0-30 |
| 111-91-1 | MSD | bis(2-Chloroethoxy)methane | 125 | 0.00 | U | 103 | 82 | 41-116 | 4 | 0-30 |
| 120-83-2 | MSD | 2,4-Dichlorophenol | 125 | 0.00 | U | 102 | 81 | 35-113 | 4 | 0-30 |
| 65-85-0 | MSD | Benzoic acid | 250 | 0.00 | U | 179 | 72 | 12-94 | 8 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86890MSD**
**Lab Sample ID** **1203178179**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/05/2014 21:54**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MSD | 4-Chloroaniline | 125 | 0.00 | U | 111 | 89 | 32-122 | 6 | 0-30 |
| 87-68-3 | MSD | Hexachlorobutadiene | 125 | 0.00 | U | 70.2 | 56 | 23-90 | 3 | 0-30 |
| 59-50-7 | MSD | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 125 | 0.00 | U | 105 | 84 | 37-119 | 4 | 0-30 |
| 77-47-4 | MSD | Hexachlorocyclopentadiene | 125 | 0.00 | U | 74.8 | 60 | 10-84 | 12 | 0-30 |
| 88-06-2 | MSD | 2,4,6-Trichlorophenol | 125 | 0.00 | U | 113 | 90 | 36-120 | 4 | 0-30 |
| 95-95-4 | MSD | 2,4,5-Trichlorophenol | 125 | 0.00 | U | 110 | 88 | 37-121 | 4 | 0-30 |
| 91-58-7 | MSD | 2-Chloronaphthalene | 125 | 0.00 | U | 95.7 | 77 | 32-103 | 5 | 0-30 |
| 88-74-4 | MSD | 2-Nitroaniline<br>*o-Nitroaniline* | 125 | 0.00 | U | 117 | 93 | 38-126 | 6 | 0-30 |
| 99-09-2 | MSD | 3-Nitroaniline<br>*m-Nitroaniline* | 125 | 0.00 | U | 119 | 95 | 30-131 | 4 | 0-30 |
| 131-11-3 | MSD | Dimethylphthalate | 125 | 0.00 | U | 111 | 89 | 45-121 | 6 | 0-30 |
| 606-20-2 | MSD | 2,6-Dinitrotoluene | 125 | 0.00 | U | 106 | 85 | 44-120 | 4 | 0-30 |
| 121-14-2 | MSD | 2,4-Dinitrotoluene | 125 | 0.00 | U | 115 | 92 | 44-127 | 6 | 0-30 |
| 51-28-5 | MSD | 2,4-Dinitrophenol | 125 | 0.00 | U | 117 | 93 | 10-133 | 14 | 0-30 |
| 132-64-9 | MSD | Dibenzofuran | 125 | 0.00 | U | 112 | 90 | 39-114 | 6 | 0-30 |
| 58-90-2 | MSD | 2,3,4,6-Tetrachlorophenol | 125 | 0.00 | U | 117 | 94 | 34-125 | 5 | 0-30 |
| 84-66-2 | MSD | Diethylphthalate | 125 | 0.00 | U | 105 | 84 | 44-124 | 5 | 0-30 |
| 100-02-7 | MSD | 4-Nitrophenol | 125 | 0.00 | U | 64.1 | 51 | 10-83 | 2 | 0-30 |
| 7005-72-3 | MSD | 4-Chlorophenylphenylether | 125 | 0.00 | U | 112 | 89 | 37-112 | 4 | 0-30 |
| 100-01-6 | MSD | 4-Nitroaniline<br>*p-Nitroaniline* | 125 | 0.00 | U | 139 | 111 | 27-149 | 9 | 0-30 |
| 534-52-1 | MSD | 2-Methyl-4,6-dinitrophenol | 125 | 0.00 | U | 112 | 89 | 28-131 | 14 | 0-30 |
| 122-39-4 | MSD | Diphenylamine | 125 | 0.00 | U | 111 | 89 | 34-117 | 6 | 0-30 |
| 122-66-7 | MSD | Azobenzene<br>*1,2-Diphenylhydrazine* | 125 | 0.00 | U | 103 | 83 | 36-115 | 6 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86890MSD**
**Lab Sample ID** **1203178179**
**Instrument:** **MSD4.I**
**Analyst:** **JMB3**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/05/2014 21:54**
**Prep Batch ID:** **1423494**
**Batch ID:** **1423498**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MSD | 4-Bromophenylphenylether | 125 | 0.00 | U | 107 | 85 | 39-112 | 6 | 0-30 |
| 118-74-1 | MSD | Hexachlorobenzene | 125 | 0.00 | U | 105 | 84 | 39-114 | 7 | 0-30 |
| 84-74-2 | MSD | Di-n-butylphthalate | 125 | 0.00 | U | 105 | 84 | 40-122 | 0 | 0-30 |
| 85-68-7 | MSD | Butylbenzylphthalate | 125 | 0.00 | U | 109 | 87 | 36-124 | 9 | 0-30 |
| 117-81-7 | MSD | bis(2-Ethylhexyl)phthalate | 125 | 0.00 | U | 109 | 87 | 35-123 | 9 | 0-30 |
| 117-84-0 | MSD | Di-n-octylphthalate | 125 | 0.00 | U | 104 | 83 | 32-124 | 5 | 0-30 |
| 123-91-1 | MSD | 1,4-Dioxane | 125 | 0.00 | U | 88.0 | 70 | 27-94 | 4 | 0-30 |
| 930-55-2 | MSD | N-Nitrosopyrrolidine | 125 | 0.00 | U | 120 | 96 | 43-117 | 4 | 0-30 |
| 95-94-3 | MSD | 1,2,4,5-Tetrachlorobenzene | 125 | 0.00 | U | 85.6 | 68 | 28-96 | 7 | 0-30 |
| 1912-24-9 | MSD | Atrazine | 125 | 0.00 | U | 113 | 90 | 18-119 | 3 | 0-30 |
| 92-87-5 | MSD | Benzidine | 250 | 0.00 | U | 150 | 60 | 10-127 | 69 * | 0-30 |
| 91-94-1 | MSD | 3,3'-Dichlorobenzidine | 125 | 0.00 | U | 94.0 | 75 | 19-120 | 4 | 0-30 |
| 120-82-1 | MSD | 1,2,4-Trichlorobenzene | 125 | 0.00 | U | 81.7 | 65 | 26-92 | 6 | 0-30 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1423494** | **Instrument ID:** | **MSD4.I** | **Data File:** | **s100514.B\s4j0506.D** |
| **Lab Sample ID:** | **1203178175** | **Prep Date:** | **10/02/2014 04:50** | **Analyzed:** | **10/05/14 16:01** |
| **Column:** | **DB-5ms** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1423494 | 1203178176 | s100514.B\s4j0507.D | 10/05/14 | 1633 |
| 02 CAWR-14-86890MS | 1203178177 | s100514.B\s4j0516.D | 10/05/14 | 2121 |
| 03 CAWR-14-86890MSD | 1203178179 | s100514.B\s4j0517.D | 10/05/14 | 2154 |
| 04 CAWR-14-86892 | 357745005 | s100514.B\s4j0524.D | 10/06/14 | 0124 |

# Quality Control Data

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203178175** | | | | |
| **Client Sample:** | **QC for batch 1423494** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1423494** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/05/2014 16:01** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0506.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203178175** | | | | |
| **Client Sample:** | **QC for batch 1423494** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1423494** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/05/2014 16:01** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0506.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 118-74-1 | Hexachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 89.4 | 100 | ug/L | 89.4 | (33%-126%) |
| 2-Fluorobiphenyl | 38.4 | 50.0 | ug/L | 76.7 | (35%-102%) |
| 2-Fluorophenol | 52.7 | 100 | ug/L | 52.7 | (18%-84%) |
| Nitrobenzene-d5 | 39.9 | 50.0 | ug/L | 79.7 | (38%-113%) |
| Phenol-d5 | 32.3 | 100 | ug/L | 32.3 | (10%-110%) |
| p-Terphenyl-d14 | 44.4 | 50.0 | ug/L | 88.7 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203178176** | | | | |
| **Client Sample:** | **QC for batch 1423494** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1423494** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/05/2014 16:33** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0507.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 28.1 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 28.5 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 28.2 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | | 40.5 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 26.6 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 28.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | | 26.3 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 45.4 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 41.6 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 44.1 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 39.3 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 37.9 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 48.3 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 43.9 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 41.2 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | | 32.8 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | | 38.3 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 47.3 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | | 43.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 40.1 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 40.2 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | | 39.3 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 45.1 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 38.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | | 15.4 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | | 45.9 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | | 45.1 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | | 67.0 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | | 39.3 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | | 35.7 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | | 44.1 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | | 42.6 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | | 39.2 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | | 39.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | | 39.3 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | | 43.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203178176** | | | | |
| **Client Sample:** | **QC for batch 1423494** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1423494** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/05/2014 16:33** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0507.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 45.0 | ug/L | 3.00 | 10.0 |
| 118-74-1 | Hexachlorobenzene | | 40.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | | 25.7 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 26.6 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | | 25.3 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | | 40.6 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 30.7 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 42.2 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 44.5 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | | 39.3 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | | 16.9 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | | 36.6 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 35.7 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 40.5 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 39.2 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 41.9 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | | 35.2 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 47.1 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | | 34.3 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 46.1 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 50.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 90.9 | 100 | ug/L | 90.9 | (33%-126%) |
| 2-Fluorobiphenyl | 39.9 | 50.0 | ug/L | 79.8 | (35%-102%) |
| 2-Fluorophenol | 52.4 | 100 | ug/L | 52.4 | (18%-84%) |
| Nitrobenzene-d5 | 40.8 | 50.0 | ug/L | 81.6 | (38%-113%) |
| Phenol-d5 | 33.0 | 100 | ug/L | 33.0 | (10%-110%) |
| p-Terphenyl-d14 | 41.5 | 50.0 | ug/L | 83.0 | (38%-123%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 16:12** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203178177** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1423494** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86890MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/05/2014 21:21** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **400 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0516.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 79.7 | ug/L | 7.50 | 25.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 77.1 | ug/L | 7.50 | 25.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 75.1 | ug/L | 7.50 | 25.0 |
| 122-66-7 | Azobenzene | | 97.0 | ug/L | 7.50 | 25.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 69.8 | ug/L | 7.50 | 25.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 74.5 | ug/L | 7.50 | 25.0 |
| 123-91-1 | 1,4-Dioxane | | 84.9 | ug/L | 7.50 | 25.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 112 | ug/L | 7.50 | 25.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 106 | ug/L | 7.50 | 25.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 108 | ug/L | 7.50 | 25.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 97.9 | ug/L | 7.50 | 25.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 93.7 | ug/L | 7.50 | 25.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 101 | ug/L | 12.5 | 50.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 109 | ug/L | 7.50 | 25.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 102 | ug/L | 7.50 | 25.0 |
| 91-58-7 | 2-Chloronaphthalene | | 90.8 | ug/L | 1.03 | 2.50 |
| 95-57-8 | 2-Chlorophenol | | 92.1 | ug/L | 7.50 | 25.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 97.3 | ug/L | 7.50 | 25.0 |
| 88-75-5 | 2-Nitrophenol | | 103 | ug/L | 7.50 | 25.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 90.7 | ug/L | 7.50 | 25.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 101 | ug/L | 7.50 | 25.0 |
| 59-50-7 | Parachlorometa cresol | | 101 | ug/L | 7.50 | 25.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 105 | ug/L | 8.25 | 25.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 108 | ug/L | 7.50 | 25.0 |
| 100-02-7 | 4-Nitrophenol | | 62.7 | ug/L | 7.50 | 25.0 |
| 62-53-3 | Aniline | | 110 | ug/L | 10.5 | 25.0 |
| 1912-24-9 | Atrazine | | 109 | ug/L | 7.50 | 25.0 |
| 92-87-5 | Benzidine | | 73.1 | ug/L | 9.75 | 25.0 |
| 65-85-0 | Benzoic acid | | 166 | ug/L | 15.0 | 50.0 |
| 100-51-6 | Benzyl alcohol | | 103 | ug/L | 7.50 | 25.0 |
| 85-68-7 | Butylbenzylphthalate | | 99.6 | ug/L | 7.50 | 25.0 |
| 84-74-2 | Di-n-butylphthalate | | 105 | ug/L | 7.50 | 25.0 |
| 117-84-0 | Di-n-octylphthalate | | 98.5 | ug/L | 7.50 | 25.0 |
| 132-64-9 | Dibenzofuran | | 106 | ug/L | 7.50 | 25.0 |
| 84-66-2 | Diethylphthalate | | 99.9 | ug/L | 7.50 | 25.0 |
| 131-11-3 | Dimethylphthalate | | 104 | ug/L | 7.50 | 25.0 |
| 88-85-7 | Dinoseb | U | 25.0 | ug/L | 7.50 | 25.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 16:12** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203178177** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1423494** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86890MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/05/2014 21:21** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **400 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0516.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 105 | ug/L | 7.50 | 25.0 |
| 118-74-1 | Hexachlorobenzene | | 98.1 | ug/L | 7.50 | 25.0 |
| 87-68-3 | Hexachlorobutadiene | | 67.9 | ug/L | 7.50 | 25.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 66.2 | ug/L | 7.50 | 25.0 |
| 67-72-1 | Hexachloroethane | | 66.2 | ug/L | 7.50 | 25.0 |
| 78-59-1 | Isophorone | | 99.7 | ug/L | 8.75 | 25.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 97.9 | ug/L | 7.50 | 25.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 25.0 | ug/L | 7.50 | 25.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 25.0 | ug/L | 7.50 | 25.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 101 | ug/L | 7.50 | 25.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 115 | ug/L | 7.50 | 25.0 |
| 98-95-3 | Nitrobenzene | | 94.8 | ug/L | 7.50 | 25.0 |
| 608-93-5 | Pentachlorobenzene | U | 25.0 | ug/L | 7.50 | 25.0 |
| 108-95-2 | Phenol | | 72.3 | ug/L | 7.50 | 25.0 |
| 110-86-1 | Pyridine | | 86.3 | ug/L | 7.50 | 25.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 87.5 | ug/L | 7.50 | 25.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 98.8 | ug/L | 7.50 | 25.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 92.7 | ug/L | 7.50 | 25.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 100 | ug/L | 7.50 | 25.0 |
| 65794-96-9 | m,p-Cresols | | 101 | ug/L | 9.25 | 25.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 114 | ug/L | 7.50 | 25.0 |
| 95-48-7 | o-Cresol | | 92.1 | ug/L | 7.50 | 25.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 110 | ug/L | 7.50 | 25.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 128 | ug/L | 7.50 | 25.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 227 | 250 | ug/L | 90.8 | (33%-126%) |
| 2-Fluorobiphenyl | 94.1 | 125 | ug/L | 75.3 | (35%-102%) |
| 2-Fluorophenol | 168 | 250 | ug/L | 67.0 | (18%-84%) |
| Nitrobenzene-d5 | 95.5 | 125 | ug/L | 76.4 | (38%-113%) |
| Phenol-d5 | 139 | 250 | ug/L | 55.5 | (10%-110%) |
| p-Terphenyl-d14 | 93.3 | 125 | ug/L | 74.6 | (38%-123%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 16:12** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203178179** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1423494** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86890MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/05/2014 21:54** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **400 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0517.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 85.6 | ug/L | 7.50 | 25.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 81.7 | ug/L | 7.50 | 25.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 76.9 | ug/L | 7.50 | 25.0 |
| 122-66-7 | Azobenzene | | 103 | ug/L | 7.50 | 25.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 70.7 | ug/L | 7.50 | 25.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 76.2 | ug/L | 7.50 | 25.0 |
| 123-91-1 | 1,4-Dioxane | | 88.0 | ug/L | 7.50 | 25.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 117 | ug/L | 7.50 | 25.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 110 | ug/L | 7.50 | 25.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 113 | ug/L | 7.50 | 25.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 102 | ug/L | 7.50 | 25.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 98.0 | ug/L | 7.50 | 25.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 117 | ug/L | 12.5 | 50.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 115 | ug/L | 7.50 | 25.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 106 | ug/L | 7.50 | 25.0 |
| 91-58-7 | 2-Chloronaphthalene | | 95.7 | ug/L | 1.03 | 2.50 |
| 95-57-8 | 2-Chlorophenol | | 97.9 | ug/L | 7.50 | 25.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 112 | ug/L | 7.50 | 25.0 |
| 88-75-5 | 2-Nitrophenol | | 109 | ug/L | 7.50 | 25.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 94.0 | ug/L | 7.50 | 25.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 107 | ug/L | 7.50 | 25.0 |
| 59-50-7 | Parachlorometa cresol | | 105 | ug/L | 7.50 | 25.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 111 | ug/L | 8.25 | 25.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 112 | ug/L | 7.50 | 25.0 |
| 100-02-7 | 4-Nitrophenol | | 64.1 | ug/L | 7.50 | 25.0 |
| 62-53-3 | Aniline | | 118 | ug/L | 10.5 | 25.0 |
| 1912-24-9 | Atrazine | | 113 | ug/L | 7.50 | 25.0 |
| 92-87-5 | Benzidine | | 150 | ug/L | 9.75 | 25.0 |
| 65-85-0 | Benzoic acid | | 179 | ug/L | 15.0 | 50.0 |
| 100-51-6 | Benzyl alcohol | | 106 | ug/L | 7.50 | 25.0 |
| 85-68-7 | Butylbenzylphthalate | | 109 | ug/L | 7.50 | 25.0 |
| 84-74-2 | Di-n-butylphthalate | | 105 | ug/L | 7.50 | 25.0 |
| 117-84-0 | Di-n-octylphthalate | | 104 | ug/L | 7.50 | 25.0 |
| 132-64-9 | Dibenzofuran | | 112 | ug/L | 7.50 | 25.0 |
| 84-66-2 | Diethylphthalate | | 105 | ug/L | 7.50 | 25.0 |
| 131-11-3 | Dimethylphthalate | | 111 | ug/L | 7.50 | 25.0 |
| 88-85-7 | Dinoseb | U | 25.0 | ug/L | 7.50 | 25.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 16:12** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203178179** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1423494** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86890MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1423498** | **Inst:** | **MSD4.I** | **Dilution:** | **1** |
| **Run Date:** | **10/05/2014 21:54** | **Analyst:** | **JMB3** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/02/2014 04:50** | **Aliquot:** | **400 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s100514.B\s4j0517.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 111 | ug/L | 7.50 | 25.0 |
| 118-74-1 | Hexachlorobenzene | | 105 | ug/L | 7.50 | 25.0 |
| 87-68-3 | Hexachlorobutadiene | | 70.2 | ug/L | 7.50 | 25.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 74.8 | ug/L | 7.50 | 25.0 |
| 67-72-1 | Hexachloroethane | | 67.3 | ug/L | 7.50 | 25.0 |
| 78-59-1 | Isophorone | | 102 | ug/L | 8.75 | 25.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 99.3 | ug/L | 7.50 | 25.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 25.0 | ug/L | 7.50 | 25.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 25.0 | ug/L | 7.50 | 25.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 108 | ug/L | 7.50 | 25.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 120 | ug/L | 7.50 | 25.0 |
| 98-95-3 | Nitrobenzene | | 98.9 | ug/L | 7.50 | 25.0 |
| 608-93-5 | Pentachlorobenzene | U | 25.0 | ug/L | 7.50 | 25.0 |
| 108-95-2 | Phenol | | 72.4 | ug/L | 7.50 | 25.0 |
| 110-86-1 | Pyridine | | 113 | ug/L | 7.50 | 25.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 91.2 | ug/L | 7.50 | 25.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 103 | ug/L | 7.50 | 25.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 97.1 | ug/L | 7.50 | 25.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 109 | ug/L | 7.50 | 25.0 |
| 65794-96-9 | m,p-Cresols | | 105 | ug/L | 9.25 | 25.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 119 | ug/L | 7.50 | 25.0 |
| 95-48-7 | o-Cresol | | 96.3 | ug/L | 7.50 | 25.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 117 | ug/L | 7.50 | 25.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 139 | ug/L | 7.50 | 25.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 239 | 250 | ug/L | 95.4 | (33%-126%) |
| 2-Fluorobiphenyl | 101 | 125 | ug/L | 80.4 | (35%-102%) |
| 2-Fluorophenol | 173 | 250 | ug/L | 69.1 | (18%-84%) |
| Nitrobenzene-d5 | 103 | 125 | ug/L | 82.0 | (38%-113%) |
| Phenol-d5 | 141 | 250 | ug/L | 56.2 | (10%-110%) |
| p-Terphenyl-d14 | 102 | 125 | ug/L | 81.2 | (38%-123%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 06-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** SEMIVOA GC/MS | **Test / Method:** SW846 3510C/8270D, SW846 8270C | **Matrix Type:** Liquid | **Client Code:** ESHL, EXCE, NFSR, SCPO, |
| **Batch ID:** 1423498 | **Sample Numbers:** See Below | | |

**Potentially affected work order(s)(SDG): 357285,357503(CAH-14-076),357615,357617,357715,357724,357742(2014-4645),357745(2014-4642)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Failed Yield for Surrogates

Failed Recovery for MSD/PSD

Sample Prepped out of Holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. MS (1203178181) and MSD (1203178182) failed spike recovery limits. Please see the QC summary report for specific failures. | 1. As the MS and MSD displayed similar recoveries, the failures were attributed to sample matrix interference and the data are reported. |
| 2. The relative percent difference between MS (1203178181) and MSD (1203178182) did not meet 0.0%-30.0% limits for Aniline at 63.4%. | 2. Aniline is not a target analyte for workorders WSRB(357285), SNLS(357615) and SNLS(357617) associated with this MS/MSD pair, therefore the RPD failure has no adverse effect on the data reported for these analytes. |
| 3. The relative percent difference between MS (1203178177) and MSD (1203178179) did not meet 0.0%-30.0% limits for Benzidine at 68.9 | 3. The individual spike recoveries were within the acceptance limits in the MS/MSD. The RPD failure has no adverse impact on the data and the results are reported. |
| 4. SNSL (357617006) failed surrogate recovery limits. Please see the QC summary report for specific failures. | 4. The sample was re-extracted out of holding as part of batch 1425040 and confirmed the surrogate failures. Data for this sample are reported from the original extraction; data from the re-extraction may be found in the Miscellaneous section of the package. |
| 5. SCPO (357724002) failed surrogate recovery limits. Please see the QC summary report for specific failures. | 5. The sample was re-extracted out of holding as part of batch 1425040 and passed all surrogate recoveries. Data for this sample are reported from both sets of extractions. |
| 6. WSRB (357285004) was re-extracted out of holding due to surrogate failures. | 6. The out of holding re-extraction recovered all surrogate within acceptance limits. The project manager was contacted and requested the re-extraction data qualified and reported. |

**Originator's Name:**

Josh Brooks 08-OCT-14

**Data Validator/Group Leader:**

Barbara Bailey 23-OCT-14

# HPLC Polynuclear Aromatic Hydrocarbon Analysis

**HPLC-PAH**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Polynuclear Aromatic Hydrocarbons** |
| Analytical Method: | SW846 8310 |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1424545 |
| Prep Batch Number: | 1424544 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

| Sample ID | Client ID |
|---|---|
| 357745006 | CAWR-14-86892 |
| 357745011 | CAWR-14-86943 |
| 1203180725 | MB for batch 1424544 |
| 1203180726 | Laboratory Control Sample (LCS) |
| 1203180729 | Laboratory Control Sample Duplicate (LCSD) |
| 1203180727 | 357826002(CAWR-14-86888) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

## Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**CCV Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPDs between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Client sample 357826002 (CAWR-14-86888) from SDG 2015-8 was chosen for matrix spike analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Samples 1203180727 (CAWR-14-86888), 357745006 (CAWR-14-86892) and 357745011 (CAWR-14-86943) were re-analyzed due an instrument shutdown after the loss of communication with the laboratory network.

The 1203180727 (CAWR-14-86888) was re-analyzed due to several target analytes falling outside of their respective retention time window.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

**Additional Comments**
The Form 8 is used only as a sequence of the analysis.

One or more analytes were detected whose concentration greatly differed between the primary and confirmation analysis (greater than 40% difference or RPD) in sample 357745011 (CAWR-14-86943). Because both detectors indicated an acceptable peak in the appropriate retention time window for these analytes, the analytes are reported as positive results. Due to the high percent difference or RPD between the two columns, it is indicated as such on the appropriate Form I/Certificate of Analysis (C of A) with a 'P' qualifier. Those analytes reported with a percent difference or RPD greater than 40% but less than 70% are qualified as presumptive evidence of the presence of the material.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the analyst, reviewer, and report specialist names associated with the generation of the data and package. The data validator will always sign and date the case narrative.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

**Chromatographic Columns**

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642 GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

J Value is estimated

P Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr. **Name: Michael Penny**

**Date: 14 OCT 2014** **Title: Group Leader**

# Roadmap for ARSL 2014-4642 HPLC_PAH

This roadmap was analyzed by map on 10-14-2014, 13:14.
This roadmap was reviewed by map on 10-14-2014, 13:15.
This roadmap was packaged by map on 10-14-2014, 15:34.

Sample

| exclude | manual | datafile | smpid | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p100814.b/ph5j0806.d | 357745006 | 08-OCT-2014 | 22:14 | 2014-4642.sub | CAWR-14-86892 | 1 | 1424545 | |
| ☐ | N | /chem/hplce.i/p100814.b/ph5j0807.d | 357745011 | 08-OCT-2014 | 22:56 | 2014-4642.sub | CAWR-14-86943 | 1 | 1424545 | |

QC Sample

| exclude | manual | datafile | smpid | sampletype | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p100714.b/ph5j0704A.d | 1203180725 | mb | 07-OCT-2014 | 14:32 | 2014-4642.sub | PAHBLK01 | 1 | 1424545 | |
| ☐ | N | /chem/hplce.i/p100714.b/ph5j0705A.d | 1203180726 | lcs | 07-OCT-2014 | 15:14 | 2014-4642.sub | PAHBLK01LCS | 1 | 1424545 | Pass |
| ☐ | N | /chem/hplce.i/p100714.b/ph5j0706A.d | 1203180729 | lcsd | 07-OCT-2014 | 15:56 | 2014-4642.sub | PAHBLK01LCSD | 1 | 1424545 | Pass |

# Sample Data Summary

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745006** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86892** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1424545** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/08/2014 22:14** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/06/2014 05:00** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j0806.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.543 | ug/L | 0.237 | 0.543 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 83-32-9 | Acenaphthene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 208-96-8 | Acenaphthylene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 120-12-7 | Anthracene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.0272 | ug/L | 0.0087 | 0.0272 |
| 218-01-9 | Chrysene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 206-44-0 | Fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 86-73-7 | Fluorene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 91-20-3 | Naphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 85-01-8 | Phenanthrene | U | 0.543 | ug/L | 0.198 | 0.543 |
| 129-00-0 | Pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 144 | 272 | ug/L | 52.9 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745011** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86943** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1424545** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/08/2014 22:56** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/06/2014 05:00** | **Aliquot:** | **880 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j0807.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.568 | ug/L | 0.248 | 0.568 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.568 | ug/L | 0.170 | 0.568 |
| 83-32-9 | Acenaphthene | U | 0.568 | ug/L | 0.170 | 0.568 |
| 208-96-8 | Acenaphthylene | U | 0.568 | ug/L | 0.170 | 0.568 |
| 120-12-7 | Anthracene | U | 0.568 | ug/L | 0.170 | 0.568 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |
| 207-08-9 | Benzo(k)fluoranthene | JP | 0.0114 | ug/L | 0.00909 | 0.0284 |
| 218-01-9 | Chrysene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |
| 206-44-0 | Fluoranthene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |
| 86-73-7 | Fluorene | U | 0.568 | ug/L | 0.170 | 0.568 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |
| 91-20-3 | Naphthalene | U | 0.568 | ug/L | 0.170 | 0.568 |
| 85-01-8 | Phenanthrene | U | 0.568 | ug/L | 0.207 | 0.568 |
| 129-00-0 | Pyrene | U | 0.0568 | ug/L | 0.0182 | 0.0568 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 173 | 284 | ug/L | 60.7 | (21%-92%) |

# QC Summary

**PAH by HPLC**

**Surrogate Recovery Report**

**SDG Number: 2014-4642**

**Matrix Type: LIQUID**

**PACK Column (1) : C-18, DAD/FLD**

| Sample ID | Client ID | DFBF %REC |
|---|---|---|
| 1203180725 | MB for batch 1424544 | 58 |
| 1203180726 | LCS for batch 1424544 | 56 |
| 1203180729 | LCSD for batch 1424544 | 50 |
| 357745006 | CAWR-14-86892 | 53 |
| 357745011 | CAWR-14-86943 | 61 |
| 1203180727 | CAWR-14-86888MS | 46 |

| Surrogate | Acceptance Limits |
|---|---|
| DFBF = Decafluorobiphenyl | (21%-92%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1424544**
**Lab Sample ID** **1203180726**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/07/2014 15:14**
**Prep Batch ID:** **1424544**
**Batch ID:** **1424545**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 32.4 | 65 | 46-92 |
| 91-57-6 | LCS | 2-Methylnaphthalene | 50.0 | 0.0 | 37.5 | 75 | 45-106 |
| 90-12-0 | LCS | 1-Methylnaphthalene | 50.0 | 0.0 | 34.8 | 70 | 47-93 |
| 208-96-8 | LCS | Acenaphthylene | 50.0 | 0.0 | 35.9 | 72 | 55-101 |
| 83-32-9 | LCS | Acenaphthene | 50.0 | 0.0 | 37.7 | 75 | 56-102 |
| 86-73-7 | LCS | Fluorene | 50.0 | 0.0 | 38.4 | 77 | 59-106 |
| 85-01-8 | LCS | Phenanthrene | 50.0 | 0.0 | 40.1 | 80 | 61-106 |
| 120-12-7 | LCS | Anthracene | 50.0 | 0.0 | 44.8 | 90 | 70-123 |
| 206-44-0 | LCS | Fluoranthene | 5.00 | 0.0 | 3.94 | 79 | 62-120 |
| 129-00-0 | LCS | Pyrene | 5.00 | 0.0 | 4.06 | 81 | 65-120 |
| 56-55-3 | LCS | Benzo(a)anthracene | 5.00 | 0.0 | 4.10 | 82 | 67-120 |
| 218-01-9 | LCS | Chrysene | 5.00 | 0.0 | 4.24 | 85 | 72-124 |
| 205-99-2 | LCS | Benzo(b)fluoranthene | 5.00 | 0.0 | 3.82 | 76 | 60-119 |
| 207-08-9 | LCS | Benzo(k)fluoranthene | 2.50 | 0.0 | 2.09 | 84 | 56-108 |
| 50-32-8 | LCS | Benzo(a)pyrene | 5.00 | 0.0 | 4.23 | 85 | 61-120 |
| 193-39-5 | LCS | Indeno(1,2,3-cd)pyrene | 5.00 | 0.0 | 3.66 | 73 | 60-120 |
| 53-70-3 | LCS | Dibenzo(a,h)anthracene | 5.00 | 0.0 | 2.02 | 40 | 33-113 |
| 191-24-2 | LCS | Benzo(ghi)perylene | 5.00 | 0.0 | 2.23 | 45 | 35-94 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCSD for batch 1424544**
**Lab Sample ID** **1203180729**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/07/2014 15:56**
**Prep Batch ID:** **1424544**
**Batch ID:** **1424545**
**Dilution: 1**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 91-20-3 | LCSD Naphthalene | 50.0 | 0.0 | 28.3 | 57 | 46-92 | 13 | 0-26 |
| 91-57-6 | LCSD 2-Methylnaphthalene | 50.0 | 0.0 | 33.1 | 66 | 45-106 | 12 | 0-20 |
| 90-12-0 | LCSD 1-Methylnaphthalene | 50.0 | 0.0 | 30.7 | 61 | 47-93 | 13 | 0-20 |
| 208-96-8 | LCSD Acenaphthylene | 50.0 | 0.0 | 31.8 | 64 | 55-101 | 12 | 0-20 |
| 83-32-9 | LCSD Acenaphthene | 50.0 | 0.0 | 32.8 | 66 | 56-102 | 14 | 0-20 |
| 86-73-7 | LCSD Fluorene | 50.0 | 0.0 | 34.5 | 69 | 59-106 | 11 | 0-20 |
| 85-01-8 | LCSD Phenanthrene | 50.0 | 0.0 | 36.8 | 74 | 61-106 | 9 | 0-20 |
| 120-12-7 | LCSD Anthracene | 50.0 | 0.0 | 40.9 | 82 | 70-123 | 9 | 0-20 |
| 206-44-0 | LCSD Fluoranthene | 5.00 | 0.0 | 3.59 | 72 | 62-120 | 9 | 0-20 |
| 129-00-0 | LCSD Pyrene | 5.00 | 0.0 | 3.68 | 74 | 65-120 | 10 | 0-20 |
| 56-55-3 | LCSD Benzo(a)anthracene | 5.00 | 0.0 | 3.71 | 74 | 67-120 | 10 | 0-20 |
| 218-01-9 | LCSD Chrysene | 5.00 | 0.0 | 3.80 | 76 | 72-124 | 11 | 0-20 |
| 205-99-2 | LCSD Benzo(b)fluoranthene | 5.00 | 0.0 | 3.47 | 69 | 60-119 | 10 | 0-20 |
| 207-08-9 | LCSD Benzo(k)fluoranthene | 2.50 | 0.0 | 1.91 | 76 | 56-108 | 9 | 0-20 |
| 50-32-8 | LCSD Benzo(a)pyrene | 5.00 | 0.0 | 3.84 | 77 | 61-120 | 10 | 0-20 |
| 193-39-5 | LCSD Indeno(1,2,3-cd)pyrene | 5.00 | 0.0 | 3.35 | 67 | 60-120 | 9 | 0-20 |
| 53-70-3 | LCSD Dibenzo(a,h)anthracene | 5.00 | 0.0 | 1.90 | 38 | 33-113 | 6 | 0-20 |
| 191-24-2 | LCSD Benzo(ghi)perylene | 5.00 | 0.0 | 2.02 | 40 | 35-94 | 10 | 0-20 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86888MS**
**Lab Sample ID** **1203180727**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/09/2014 16:08**
**Prep Batch ID:** **1424544**
**Batch ID:** **1424545**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 91-20-3 | MS | Naphthalene | 51.5 | 0.00 | U | 27.1 | 52 | 31-105 |
| 91-57-6 | MS | 2-Methylnaphthalene | 51.5 | 0.00 | U | 31.7 | 61 | 45-106 |
| 90-12-0 | MS | 1-Methylnaphthalene | 51.5 | 0.00 | U | 29.2 | 57 | 47-93 |
| 208-96-8 | MS | Acenaphthylene | 51.5 | 0.00 | U | 30.7 | 60 | 42-107 |
| 83-32-9 | MS | Acenaphthene | 51.5 | 0.00 | U | 31.6 | 61 | 43-107 |
| 86-73-7 | MS | Fluorene | 51.5 | 0.00 | U | 38.5 | 75 | 48-109 |
| 85-01-8 | MS | Phenanthrene | 51.5 | 0.00 | U | 42.7 | 83 | 52-111 |
| 120-12-7 | MS | Anthracene | 51.5 | 0.00 | U | 49.6 | 96 | 56-125 |
| 206-44-0 | MS | Fluoranthene | 5.15 | 0.00 | U | 4.06 | 79 | 48-115 |
| 129-00-0 | MS | Pyrene | 5.15 | 0.00 | U | 4.42 | 86 | 47-130 |
| 56-55-3 | MS | Benzo(a)anthracene | 5.15 | 0.00 | U | 4.61 | 89 | 51-116 |
| 218-01-9 | MS | Chrysene | 5.15 | 0.00 | U | 4.66 | 90 | 56-130 |
| 205-99-2 | MS | Benzo(b)fluoranthene | 5.15 | 0.00 | U | 4.43 | 86 | 45-120 |
| 207-08-9 | MS | Benzo(k)fluoranthene | 2.58 | 0.00 | U | 2.42 | 94 | 39-122 |
| 50-32-8 | MS | Benzo(a)pyrene | 5.15 | 0.00 | U | 4.80 | 93 | 48-119 |
| 193-39-5 | MS | Indeno(1,2,3-cd)pyrene | 5.15 | 0.00 | U | 4.61 | 89 | 45-120 |
| 53-70-3 | MS | Dibenzo(a,h)anthracene | 5.15 | 0.00 | U | 5.04 | 98 | 33-136 |
| 191-24-2 | MS | Benzo(ghi)perylene | 5.15 | 0.00 | U | 4.12 | 80 | 34-115 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1424544** | **Instrument ID:** | **HPLCE.I** | **Data File:** | **ph5j0704.d** |
| **Lab Sample ID:** | **1203180725** | **Prep Date:** | **10/06/2014 05:00** | **Analyzed:** | **10/07/14 14:32** |
| **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1424544 | 1203180726 | ph5j0705.d | 10/07/14 | 1514 |
| 02 LCSD for batch 1424544 | 1203180729 | ph5j0706.d | 10/07/14 | 1556 |
| 03 CAWR-14-86892 | 357745006 | ph5j0806.d | 10/08/14 | 2214 |
| 04 CAWR-14-86943 | 357745011 | ph5j0807.d | 10/08/14 | 2256 |
| 05 CAWR-14-86888MS | 1203180727 | ph5j0904.d | 10/09/14 | 1608 |

# QC Data

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180725** | | | | |
| **Client Sample:** | **QC for batch 1424544** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1424544** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1424545** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 14:32** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/06/2014 05:00** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j0704.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.500 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.025 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | U | 0.500 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 144 | 250 | ug/L | 57.8 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180726** | | | | |
| **Client Sample:** | **QC for batch 1424544** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1424544** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1424545** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 15:14** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/06/2014 05:00** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j0705.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 34.8 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | | 37.5 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | | 37.7 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | | 35.9 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | | 44.8 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | | 4.10 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | | 4.23 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | | 3.82 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | | 2.23 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.09 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | | 4.24 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 2.02 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | | 3.94 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | | 38.4 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 3.66 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | | 32.4 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | | 40.1 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | | 4.06 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 139 | 250 | ug/L | 55.6 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180729** | | | | |
| **Client Sample:** | **QC for batch 1424544** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1424544** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1424545** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 15:56** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/06/2014 05:00** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j0706.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 30.7 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | | 33.1 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | | 32.8 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | | 31.8 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | | 40.9 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | | 3.71 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | | 3.84 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | | 3.47 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | | 2.02 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | | 1.91 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | | 3.80 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 1.90 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | | 3.59 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | | 34.5 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 3.35 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | | 28.3 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | | 36.8 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | | 3.68 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 124 | 250 | ug/L | 49.5 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/30/2014 17:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203180727** | **Date Received:** | **10/02/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1424544** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86888MS** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1424545** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/09/2014 16:08** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/06/2014 05:00** | **Aliquot:** | **970 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j0904.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 29.2 | ug/L | 0.225 | 0.515 |
| 91-57-6 | 2-Methylnaphthalene | | 31.7 | ug/L | 0.155 | 0.515 |
| 83-32-9 | Acenaphthene | | 31.6 | ug/L | 0.155 | 0.515 |
| 208-96-8 | Acenaphthylene | | 30.7 | ug/L | 0.155 | 0.515 |
| 120-12-7 | Anthracene | | 49.6 | ug/L | 0.155 | 0.515 |
| 56-55-3 | Benzo(a)anthracene | | 4.61 | ug/L | 0.0165 | 0.0515 |
| 50-32-8 | Benzo(a)pyrene | | 4.80 | ug/L | 0.0165 | 0.0515 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.43 | ug/L | 0.0165 | 0.0515 |
| 191-24-2 | Benzo(ghi)perylene | | 4.12 | ug/L | 0.0165 | 0.0515 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.42 | ug/L | 0.00825 | 0.0258 |
| 218-01-9 | Chrysene | | 4.66 | ug/L | 0.0165 | 0.0515 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 5.04 | ug/L | 0.0165 | 0.0515 |
| 206-44-0 | Fluoranthene | | 4.06 | ug/L | 0.0165 | 0.0515 |
| 86-73-7 | Fluorene | | 38.5 | ug/L | 0.155 | 0.515 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.61 | ug/L | 0.0165 | 0.0515 |
| 91-20-3 | Naphthalene | | 27.1 | ug/L | 0.155 | 0.515 |
| 85-01-8 | Phenanthrene | | 42.7 | ug/L | 0.188 | 0.515 |
| 129-00-0 | Pyrene | | 4.42 | ug/L | 0.0165 | 0.0515 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 119 | 258 | ug/L | 46.3 | (21%-92%) |

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1424653 |
| Prep Batch Number: | 1424652 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203180964 | Interference Check Sample (ICS) |
| 1203180960 | Method Blank (MB) |
| 1203180961 | Laboratory Control Sample (LCS) |
| 1203180962 | 358008003(CAWR-14-86960) Matrix Spike (MS) |
| 1203180963 | 358008003(CAWR-14-86960) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
The initial calibration verification standard (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 358008003 (CAWR-14-86960) from SDG 2015-20 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 18 OCT 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1424652

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-86969

**Date Received:** 01-OCT-14

**GEL Job No (SDG):** 2014-4642

**GEL Sample ID:** 357745004

**Date Filtered:** 10-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.323 | ug/L | | 1 | 13-OCT-14 12:37 | per1013027a |
| | Perchlorate Isotope Ratio | | | 3.23 | | | 1 | 13-OCT-14 12:37 | per1013027a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.330 | ug/L | | 1 | 13-OCT-14 12:37 | per1013027a |
| | Perchlorate-O(18) | | | 0.530 | ug/L | | 1 | 13-OCT-14 12:37 | per1013027a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2014-4642

**Extract Batch Code:** 1424652

**Date Filtered:** 10-OCT-14

**Matrix:** WATER

**Sample ID:** 1203180961

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .191 | ug/L | 95.5 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.02 | | | | - |
| Perchlorate-101 | 0.200 | .209 | ug/L | 104 | | 85 - 115 |
| Perchlorate-O(18) | | .502 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2014-4642

**Extract Batch Code:** 1424652

**Date Extracted:** 10-OCT-14

**GEL MS/PS ID:** 1203180962

**Client ID:** CAWR-14-86960

**GEL MSD/PSD ID:** 1203180963

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.349 | ug/L | 0.536 | 93.5 | .547 | 99 | 2.02 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.14 | | 3.07 | | 3.23 | | 5.2 | | - |
| Perchlorate-101 | 0.200 | 0.366 | ug/L | 0.576 | 105 | .558 | 96 | 3.18 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.508 | ug/L | 0.504 | | .519 | | 2.83 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1424652

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 10-OCT-14

**GEL Job No (SDG):** 2014-4642

**GEL Sample ID:** 1203180960

**Date Filtered:** 10-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 13-OCT-14 12:13 | per1013024a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 13-OCT-14 12:13 | per1013024a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 13-OCT-14 12:13 | per1013024a |
| | Perchlorate-O(18) | | | 0.499 | ug/L | | 1 | 13-OCT-14 12:13 | per1013024a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1424652

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 10-OCT-14

**GEL Job No (SDG):** 2014-4642

**GEL Sample ID:** 1203180961

**Date Filtered:** 10-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.191 | ug/L | J | 1 | 13-OCT-14 12:21 | per1013025a |
| | Perchlorate Isotope Ratio | | | 3.02 | | | 1 | 13-OCT-14 12:21 | per1013025a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.209 | ug/L | | 1 | 13-OCT-14 12:21 | per1013025a |
| | Perchlorate-O(18) | | | 0.502 | ug/L | | 1 | 13-OCT-14 12:21 | per1013025a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1424652

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2014-4642

**GEL Sample ID:** 1203180964

**Date Filtered:** 10-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.199 | ug/L | J | 1 | 13-OCT-14 12:29 | per1013026a |
| | Perchlorate Isotope Ratio | | | 2.97 | | | 1 | 13-OCT-14 12:29 | per1013026a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.221 | ug/L | | 1 | 13-OCT-14 12:29 | per1013026a |
| | Perchlorate-O(18) | | | 0.523 | ug/L | | 1 | 13-OCT-14 12:29 | per1013026a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1424652

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-86960MS

**Date Received:** 03-OCT-14

**GEL Job No (SDG):** 2014-4642

**GEL Sample ID:** 1203180962

**Date Filtered:** 10-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.536 | ug/L | | 1 | 13-OCT-14 15:32 | per1013049a |
| | Perchlorate Isotope Ratio | | | 3.07 | | | 1 | 13-OCT-14 15:32 | per1013049a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.576 | ug/L | | 1 | 13-OCT-14 15:32 | per1013049a |
| | Perchlorate-O(18) | | | 0.504 | ug/L | | 1 | 13-OCT-14 15:32 | per1013049a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1424652

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-86960MSD

**Date Received:** 03-OCT-14

**GEL Job No (SDG):** 2014-4642

**GEL Sample ID:** 1203180963

**Date Filtered:** 10-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.547 | ug/L | | 1 | 13-OCT-14 15:40 | per1013050a |
| | Perchlorate Isotope Ratio | | | 3.23 | | | 1 | 13-OCT-14 15:40 | per1013050a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.558 | ug/L | | 1 | 13-OCT-14 15:40 | per1013050a |
| | Perchlorate-O(18) | | | 0.519 | ug/L | | 1 | 13-OCT-14 15:40 | per1013050a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Explosives by LCMSMS Analysis

# Case Narrative

**LC-MS/MS Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Analysis of Nitroaromatic Explosives Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by SW-846 Method 8321 Modified (8321M)** |
| Analytical Method: | SW846 3535/8321A Modified |
| Prep Method: | SW846 Method 3535 |
| Analytical Batch Number: | 1423664 |
| Prep Batch Number: | 1423661 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535/8321A Modified:

| Sample ID | Client ID |
|---|---|
| 357745007 | CAWR-14-86892 |
| 1203178538 | MB for batch 1423661 |
| 1203178539 | Laboratory Control Sample (LCS) |
| 1203178540 | Laboratory Control Sample Duplicate (LCSD) |

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-056 REV# 17.

**Primary Analyte Analysis**

## Calibration Information

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.
**CRI Requirements**
All low level calibration verification (CRI) requirements for this analysis were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries were within the established acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD (1203178540) did not meet acceptance criteria for the recovery of Tetryl at 56.4%. The limits are 62-117%. Since the LCS (1203178539) met acceptance criteria for all target analytes, the non-conforming LCSD spike recovery may be attributed to vagaries in the extraction process. The samples were not re-extracted because they were more than two times out of the holding period required by the method. The data are reported with the appropriate DER.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The LCS/LCSD pair (1203178539/1203178540) did not meet RPD acceptance criteria for Tetryl at 25.4%. The limits are 0-19%. Since the LCS (1203178539) met acceptance criteria for all target analytes, the non-conforming LCSD spike recovery may be attributed to vagaries in the extraction process. The samples were not re-extracted because they were more than two times out of the holding period required by the method. The data are reported with the appropriate DER.

**QC Sample Designation**
A matrix spike and matrix spike duplicate were not performed with this SDG in this batch.

**Internal Standard (ISTD) Acceptance**
A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000.

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

**Secondary Analyte Analysis**

**Calibration Information**

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
All low level calibration verification (CRI) requirements for this analysis were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries were within the established acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries were within the established acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPDs between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
A matrix spike and matrix spike duplicate were not performed with this SDG in this batch.

**Internal Standard (ISTD) Acceptance**
The internal standards were not added to the Secondary analyte extracts.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data Exception Report 1347284 was generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples required manual integrations due to software limitations.

**Additional Comments**
Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct.

Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LC-MS/MS #1, and LC-MS/MS #2, respectively. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis.

The laboratory also utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC-MS/MS #3 or LC-MS/MS #4. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

The detection of the Primary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

The detection of the Secondary analytes is accomplished through analysis on the following reversed phase column:

YMC: J'sphere ODS-H80, 150 x 4.6mm I.D.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 25 OCT 2014**  **Title: Group Leader**

# Sample Data Summary

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-86892

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 357745007

**Sample Amount** 860 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1017034.wiff

**Date Analyzed:** 18-OCT-14 08:42

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.291 | U | 0.093 | 0.291 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.291 | U | 0.093 | 0.291 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.291 | U | 0.093 | 0.291 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.291 | U | 0.093 | 0.291 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.291 | U | 0.093 | 0.291 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.291 | U | 0.093 | 0.291 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.291 | U | 0.093 | 0.291 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.291 | U | 0.0953 | 0.291 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.291 | U | 0.093 | 0.291 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.291 | U | 0.093 | 0.291 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.291 | U | 0.093 | 0.291 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.291 | U | 0.093 | 0.291 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.581 | U | 0.093 | 0.581 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-86892

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 357745007

**Sample Amount** 860 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.581 | U | 0.116 | 0.581 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.581 | U | 0.174 | 0.581 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-86892

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 357745007

**Sample Amount** 860 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS10110031.wiff

**Date Analyzed:** 12-OCT-14 02:02

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.16 | U | 0.349 | 1.16 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.16 | U | 0.349 | 1.16 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.16 | U | 0.349 | 1.16 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.91 | U | 0.581 | 2.91 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.91 | U | 0.581 | 2.91 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# Quality Control Summary

# High Explosives Surrogate Recovery Summary

**Lab Name:** GEL Laboratories LLC **GEL Job No (SDG):** 2014-4642

**Lab Code:** GEL **HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 357745007 | CAWR-14-86892 | 85.2 | 65 - 114 | |
| 1203178538 | MB for batch 1423661 | 89.6 | 65 - 114 | |
| 1203178539 | LCS for batch 1423661 | 93.2 | 65 - 114 | |
| 1203178540 | LCSD for batch 1423661 | 82 | 65 - 114 | |

DNT = 3,4-Dinitrotoluene

**Lab Code:** GEL **HPLC Column:** YMC J'sphere ODS-H80

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 357745007 | CAWR-14-86892 | 86.8 | 65 - 114 | |
| 1203178538 | MB for batch 1423661 | 90.8 | 65 - 114 | |
| 1203178539 | LCS for batch 1423661 | 92 | 65 - 114 | |
| 1203178540 | LCSD for batch 1423661 | 85.6 | 65 - 114 | |

DNT = 3,4-Dinitrotoluene

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Extract Batch Code:** 1423661

**Date Extracted:** 02-OCT-14

**GEL LCS ID:** 1203178539

**GEL LCSDUP ID:** 1203178540

**Analysis Date/Time:** 18-OCT-14 04:37

**DUP Analysis Date/Time:** 18-OCT-14 05:12

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec | # | LCSD Conc | LCSD Rec | # | RPD | # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | 5 | 4.4 | 88 | | 4.01 | 80.2 | | 9.28 | | 25 | 70 - 116 |
| 2,4,6-Trinitrotoluene | 5 | 4.42 | 88.4 | | 4.04 | 80.8 | | 8.98 | | 25 | 71 - 119 |
| 2,4-Dinitrotoluene | 5 | 4.84 | 96.8 | | 4.11 | 82.2 | | 16.3 | | 25 | 74 - 114 |
| 2,6-Dinitrotoluene | 5 | 4.65 | 93 | | 4.18 | 83.6 | | 10.6 | | 25 | 73 - 108 |
| 2-Amino-4,6-dinitrotoluene | 5 | 4.75 | 95 | | 4.3 | 86 | | 9.95 | | 25 | 71 - 119 |
| 4-Amino-2,6-dinitrotoluene | 5 | 4.5 | 90 | | 4.14 | 82.8 | | 8.33 | | 25 | 75 - 120 |
| HMX | 5 | 4.29 | 85.8 | | 3.82 | 76.4 | | 11.6 | | 25 | 61 - 118 |
| Nitrobenzene | 5 | 4.72 | 94.4 | | 4.06 | 81.2 | | 15 | | 25 | 65 - 112 |
| PETN | 5 | 4.59 | 91.8 | | 4.05 | 81 | | 12.5 | | 25 | 64 - 119 |
| RDX | 5 | 4.77 | 95.4 | | 4.42 | 88.4 | | 7.62 | | 25 | 71 - 125 |
| Tetryl | 5 | 3.64 | 72.8 | | 2.82 | 56.4 | * | 25.4 | * | 19 | 62 - 117 |
| m-Dinitrobenzene | 5 | 5.09 | 102 | | 4.81 | 96.2 | | 5.66 | | 25 | 73 - 119 |
| m-Nitrotoluene | 5 | 4.7 | 94 | | 3.96 | 79.2 | | 17.1 | | 25 | 67 - 112 |
| o-Nitrotoluene | 5 | 4.5 | 90 | | 4.13 | 82.6 | | 8.58 | | 25 | 65 - 111 |
| p-Nitrotoluene | 5 | 4.72 | 94.4 | | 4.2 | 84 | | 11.7 | | 25 | 65 - 113 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Extract Batch Code:** 1423661

**Date Extracted:** 02-OCT-14

**GEL LCS ID:** 1203178539

**GEL LCSDUP ID:** 1203178540

**Analysis Date/Time:** 11-OCT-14 23:15

**DUP Analysis Date/Time:** 11-OCT-14 23:32

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec | # | LCSD Conc | LCSD Rec | # | RPD | # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 5 | 4.19 | 83.8 | | 4.43 | 88.6 | | 5.57 | | 25 | 58 - 108 |
| 2,6-Diamino-4-nitrotoluene | 5 | 4.53 | 90.6 | | 4.47 | 89.4 | | 1.33 | | 25 | 65 - 110 |
| 3,5-Dinitroaniline | 5 | 4.03 | 80.6 | | 3.87 | 77.4 | | 4.05 | | 25 | 69 - 118 |
| TATB | 10 | 6.86 | 68.6 | | 6.37 | 63.7 | | 7.41 | | 11 | 23 - 142 |
| tris(o-cresyl) phosphate | 5 | 3.69 | 73.8 | | 3.58 | 71.6 | | 3.03 | | 25 | 42 - 89 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

# Quality Control Data

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178538

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1017026.wiff

**Date Analyzed:** 18-OCT-14 04:02

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.250 | U | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.250 | U | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.250 | U | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.500 | U | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178538

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.500 | U | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.500 | U | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178538

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS10110020.wiff

**Date Analyzed:** 11-OCT-14 22:58

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.00 | U | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.00 | U | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.00 | U | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.50 | U | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.50 | U | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178539

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1017027.wiff

**Date Analyzed:** 18-OCT-14 04:37

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 3.64 | | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |
| 2691-41-0 | HMX | 4.29 | | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.4 | | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.42 | | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.5 | | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.5 | | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 78-11-5 | PETN | 4.59 | | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.65 | | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.7 | | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 4.72 | | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-99-0 | p-Nitrotoluene | 4.72 | | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.75 | | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 121-82-4 | RDX | 4.77 | | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178539

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 121-14-2 | 2,4-Dinitrotoluene | 4.84 | | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.09 | | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178539

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS10110021.wiff

**Date Analyzed:** 11-OCT-14 23:15

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 3.69 | | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 4.03 | | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 4.19 | | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.53 | | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 3058-38-6 | TATB | 6.86 | | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCSD for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178540

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1017028.wiff

**Date Analyzed:** 18-OCT-14 05:12

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 2.82 | | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |
| 2691-41-0 | HMX | 3.82 | | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 99-08-1 | m-Nitrotoluene | 3.96 | | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.01 | | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.04 | | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 78-11-5 | PETN | 4.05 | | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 98-95-3 | Nitrobenzene | 4.06 | | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.11 | | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.13 | | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.14 | | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.18 | | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 99-99-0 | p-Nitrotoluene | 4.2 | | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.3 | | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCSD for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178540

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 121-82-4 | RDX | 4.42 | | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 99-65-0 | m-Dinitrobenzene | 4.81 | | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCSD for batch 1423661

**Lab Code:** GEL

**GEL Job No (SDG)** 2014-4642

**Matrix:** WATER

**GEL Sample ID:** 1203178540

**Sample Amount** 1000 mL

**Date Received:** 01-OCT-14

**Moisture:**

**Extraction Batch ID:** 1423661

**Extraction Type** Sol Exchange

**Date Extracted:** 02-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS10110022.wiff

**Date Analyzed:** 11-OCT-14 23:32

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 3.58 | | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 3.87 | | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 4.43 | | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.47 | | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 3058-38-6 | TATB | 6.37 | | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 17-OCT-14 13:29

**GEL Data File:** EXP1017001.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 17-OCT-14 14:04

**GEL Data File:** EXP1017002.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 11-OCT-14 17:41

**GEL Data File:** EXS10110001.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 3.79 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 11-OCT-14 17:57

**GEL Data File:** EXS10110002.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 17-OCT-14 18:08

**GEL Data File:** EXP1017009.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 17-OCT-14 19:18

**GEL Data File:** EXP1017011.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 18-OCT-14 01:43

**GEL Data File:** EXP1017022.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 18-OCT-14 02:53

**GEL Data File:** EXP1017024.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK06

**Analysis Date:** 18-OCT-14 09:17

**GEL Data File:** EXP1017035.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 18-OCT-14 10:27

**GEL Data File:** EXP1017037.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 11-OCT-14 20:11

**GEL Data File:** EXS10110010.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 11.7 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.67 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 11-OCT-14 20:45

**GEL Data File:** EXS10110012.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 6.01 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | .997 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 11-OCT-14 22:42

**GEL Data File:** EXS10110019.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 5.01 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 12-OCT-14 00:22

**GEL Data File:** EXS10110025.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 4.89 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | .891 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK06

**Analysis Date:** 12-OCT-14 02:19

**GEL Data File:** EXS10110032.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2014-4642

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 12-OCT-14 03:59

**GEL Data File:** EXS10110038.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 4.33 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.06 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 23-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LC-MS/MS | SW846 3535/8321A Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1423664 | See Below | | |

**Potentially affected work order(s)(SDG): 357742(2014-4645),357745(2014-4642)**

**Application Issues:**

Failed RPD for MS/MSD, or PS/PSD

Failed Recovery for LCS/LCSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The LCSD (1203178540) did not meet acceptance criteria for the recovery of Tetryl at 56.4%. The limits are 62-117%.<br><br>2. The LCS/LCSD pair (1203178539/1203178540) did not meet acceptance criteria for RPD limits for Tetryl at 25.4%. The limits are 0-19%. | 1. & 2. Since the LCS (1203178539) met acceptance criteria for all target analytes, the non-conforming LCSD spike recovery may be attributed to vagaries in the extraction process. The samples were not re-extracted because they were more than two times out of the holding period required by the method. The data are reported with the appropriate DER. The discrepancies are noted in the Case Narrative. |

**Originator's Name:**

Lynne Russell 24-OCT-14

**Data Validator/Group Leader:**

Michael Penny 24-OCT-14

# Pesticide Analysis

# Case Narrative

**Pesticide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water by GC/ECD Using Methods 504.1 or 8011** |
| Analytical Method: | SW846 8011 |
| Prep Method: | SW846 8011 PREP |
| Analytical Batch Number: | 1424420 |
| Prep Batch Number: | 1424419 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 357745001 | CAWR-14-86942 |
| 357745013 | CAWR-14-86916 |
| 357745015 | CAWR-14-87098 |
| 1203180617 | MB for batch 1424419 |
| 1203180413 | Laboratory Control Sample (LCS) |
| 1203180414 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-059 REV# 12.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate were biased high in samples 357745013 (CAWR-14-86916). As no target analytes were detected in the samples, the reported data were not adversely impacted by the surrogate failures.

**Laboratory Control Sample (LCS) Recovery**
The laboratory control sample (LCS) spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD values between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike (MS) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike Duplicate (MSD) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**MS/MSD Relative Percent Difference (RPD) Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Technical Information:**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG in this analytical batch met the specified holding time.

**Sample preservation**
All samples in this batch met preservation and integrity requirements.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

**Sample Dilutions**
The samples in this SDG in this analytical batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Electronic Package Comment**

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1341258. 357745013 (CAWR-14-86916).

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

**Additional Comments**
The higher value is reported.

**System Configuration**

The 504.1/8011 analysis of EDB/DBCP was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-50-504/8011 | 30m x 0.53mm, 1.00um |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-XLB-504/8 | 30m x 0.53mm, 1.50um |

**Method/Analysis Information**

| | |
|---|---|
| **Procedure:** | **Analysis of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water by GC/ECD Using Methods 504.1 or 8011** |
| Analytical Method: | SW846 8011 |
| Prep Method: | SW846 8011 PREP |
| Analytical Batch Number: | 1424504 |
| Prep Batch Number: | 1424503 |

**Sample Analysis**

| Sample ID | Client ID |
|---|---|
| 357745009 | CAWR-14-86915 |
| 1203180618 | MB for batch 1424503 |
| 1203180607 | Laboratory Control Sample (LCS) |
| 1203180608 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

**Preparation/Analytical Method Verification**

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-059 REV# 12.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation quantitation reports per standard operating procedures (SOP).

**Calibration Information**

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All calibration verification standards (CVS, ICV, or CCV) requirements have not been met for this SDG. Several target analytes failed acceptance criteria with a positive bias on one analytical column in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. These target analytes were not detected above the PQL in the samples; therefore, the non-compliance has no adverse effects on the data.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**

All surrogate recoveries were within the established acceptance criteria for this analytical batch for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The laboratory control sample (LCS) spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD values between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike (MS) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike Duplicate (MSD) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**MS/MSD Relative Percent Difference (RPD) Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Technical Information:**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG in this analytical batch met the specified holding time.

**Sample preservation**
Samples had a pH of 2. 357745009 (CAWR-14-86915).

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

**Sample Dilutions**
The samples in this SDG in this analytical batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Electronic Package Comment**

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

**Data Exception (DER) Documentation**
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for this SDG in this batch.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

**Additional Comments**
The higher result is reported.

**System Configuration**

The 504.1/8011 analysis of EDB/DBCP was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-50-504/8011 | 30m x 0.53mm, 1.00um |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-XLB-504/8 | 30m x 0.53mm, 1.50um |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Cameron Bearden  **Name: Cameron Bearden**

**Date: 28 OCT 2014**  **Title: Group Leader**

# Sample Data Summary

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745001** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86942** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424420** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 13:00** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 10:35** | **Aliquot:** | **35.41 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **100614HE\e1j0609.D** | **Column:** | **1 ZB-50** | | |
| | **100614HE\e1j0609.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0198 | ug/L | 0.00593 | 0.0198 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0198 | ug/L | 0.00593 | 0.0198 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.63 | 3.53 | ug/L | 131 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745009** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **8011** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86915** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424504** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/13/2014 14:26** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 10:16** | **Aliquot:** | **35.55 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101314HE\e1j1310.D** | **Column:** | **1 ZB-50** | | |
| | **101314HE\e1j1310.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0197 | ug/L | 0.00591 | 0.0197 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0197 | ug/L | 0.00591 | 0.0197 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.73 | 3.52 | ug/L | 135 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745013** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **8011** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86916** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424420** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 13:21** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 10:35** | **Aliquot:** | **34.82 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **100614HE\e1j0610.D** | **Column:** | **1 ZB-50** | | |
| | **100614HE\e1j0610.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0201 | ug/L | 0.00603 | 0.0201 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0201 | ug/L | 0.00603 | 0.0201 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | | Acceptable Limits |
|---|---|---|---|---|---|---|
| Bromofluorobenzene | 8.18 | 3.59 | ug/L | 228 | * | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745015** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-87098** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424420** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 13:42** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 10:35** | **Aliquot:** | **34.38 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **100614HE\e1j0611.D** | **Column:** | **1 ZB-50** | | |
| | **100614HE\e1j0611.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0204 | ug/L | 0.00611 | 0.0204 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0204 | ug/L | 0.00611 | 0.0204 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.52 | 3.64 | ug/L | 124 | (56%-145%) |

# Quality Control Summary

**Pesticide**

## Surrogate Recovery Report

**SDG Number: 2014-4642**

**Matrix Type: LIQUID**

| Sample ID | Client ID | BFB 1 %REC # | BFB 2 %REC # |
|---|---|---|---|
| 1203180617 | MB for batch 1424419 | 103 | 119 |
| 1203180413 | LCS for batch 1424419 | 106 | 121 |
| 1203180414 | LCSD for batch 1424419 | 105 | 124 |
| 357745001 | CAWR-14-86942 | 114 | 131 |
| 357745013 | CAWR-14-86916 | 125 | 228 * |
| 357745015 | CAWR-14-87098 | 108 | 124 |
| 1203180618 | MB for batch 1424503 | 92 | 111 |
| 1203180607 | LCS for batch 1424503 | 110 | 130 |
| 1203180608 | LCSD for batch 1424503 | 111 | 130 |
| 357745009 | CAWR-14-86915 | 118 | 135 |

| Surrogate | Acceptance Limits |
|---|---|
| BFB = Bromofluorobenzene | (56%-145%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Pesticide**

## Quality Control Summary
## Spike Recovery Report

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1424419**
**Lab Sample ID** **1203180413**
**Instrument:** **ECD1A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/06/2014 12:17**
**Dilution: 1**
**Prep Batch ID:** **1424419**
**Batch ID:** **1424420**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-93-4 | LCS | 1,2-Dibromoethane | 0.200 | 0.0 | 0.252 | 126 | 70-130 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.236 | 118 | 70-130 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCSD for batch 1424419**
**Lab Sample ID** **1203180414**
**Instrument:** **ECD1A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/06/2014 12:38**
**Dilution: 1**
**Prep Batch ID:** **1424419**
**Batch ID:** **1424420**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-93-4 | LCSD 1,2-Dibromoethane | 0.200 | 0.0 | 0.252 | 126 | 70-130 | 0 | 0-20 |
| 96-12-8 | LCSD 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.232 | 116 | 70-130 | 1 | 0-20 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1424503**
**Lab Sample ID** **1203180607**
**Instrument:** **ECD1A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/13/2014 13:43**
**Dilution: 1**
**Prep Batch ID:** **1424503**
**Batch ID:** **1424504**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-93-4 | LCS | 1,2-Dibromoethane | 0.200 | 0.0 | 0.246 | 123 | 70-130 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.234 | 117 | 70-130 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCSD for batch 1424503**
**Lab Sample ID** **1203180608**
**Instrument:** **ECD1A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/13/2014 14:04**
**Dilution: 1**
**Prep Batch ID:** **1424503**
**Batch ID:** **1424504**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-93-4 | LCSD 1,2-Dibromoethane | 0.200 | 0.0 | 0.247 | 124 | 70-130 | 0 | 0-20 |
| 96-12-8 | LCSD 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.237 | 118 | 70-130 | 1 | 0-20 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1424419** | **Instrument ID:** | **ECD1A.I_1**<br>**ECD1A.I_2** | **Data File:** | **100614HE\e1j0606.D**<br>**100614HE\e1j0606.D** |
| **Lab Sample ID:** | **1203180617** | | | | |
| **Column:** | **ZB-50**<br>**ZB-XLB** | **Prep Date:** | **10/06/2014 10:35** | **Analyzed:** | **10/06/14 11:56** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1424419** | **1203180413** | **100614HE\e1j0607.D**<br>**100614HE\e1j0607.D** | **10/06/14** | **1217** |
| **02 LCSD for batch 1424419** | **1203180414** | **100614HE\e1j0608.D**<br>**100614HE\e1j0608.D** | **10/06/14** | **1238** |
| **03 CAWR-14-86942** | **357745001** | **100614HE\e1j0609.D**<br>**100614HE\e1j0609.D** | **10/06/14** | **1300** |
| **04 CAWR-14-86916** | **357745013** | **100614HE\e1j0610.D**<br>**100614HE\e1j0610.D** | **10/06/14** | **1321** |
| **05 CAWR-14-87098** | **357745015** | **100614HE\e1j0611.D**<br>**100614HE\e1j0611.D** | **10/06/14** | **1342** |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1424503** | **Instrument ID:** | **ECD1A.I_1**<br>**ECD1A.I_2** | **Data File:** | **101314HE\e1j1307.D**<br>**101314HE\e1j1307.D** |
| **Lab Sample ID:** | **1203180618** | | | | |
| **Column:** | **ZB-50**<br>**ZB-XLB** | **Prep Date:** | **10/13/2014 10:16** | **Analyzed:** | **10/13/14 13:22** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1424503** | **1203180607** | **101314HE\e1j1308.D**<br>**101314HE\e1j1308.D** | **10/13/14** | **1343** |
| **02 LCSD for batch 1424503** | **1203180608** | **101314HE\e1j1309.D**<br>**101314HE\e1j1309.D** | **10/13/14** | **1404** |
| **03 CAWR-14-86915** | **357745009** | **101314HE\e1j1310.D**<br>**101314HE\e1j1310.D** | **10/13/14** | **1426** |

# Quality Control Data

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180413** | | | | |
| **Client Sample:** | **QC for batch 1424419** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1424419** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424420** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 12:17** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 10:35** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **100614HE\e1j0607.D** | **Column:** | **1 ZB-50** | | |
| | **100614HE\e1j0607.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.236 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.252 | ug/L | 0.006 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.31 | 3.57 | ug/L | 121 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180414** | | | | |
| **Client Sample:** | **QC for batch 1424419** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1424419** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424420** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 12:38** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 10:35** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **100614HE\e1j0608.D** | **Column:** | **1 ZB-50** | | |
| | **100614HE\e1j0608.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.232 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.252 | ug/L | 0.006 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.44 | 3.57 | ug/L | 124 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180607** | | | | |
| **Client Sample:** | **QC for batch 1424503** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1424503** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424504** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/13/2014 13:43** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 10:16** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101314HE\e1j1308.D** | **Column:** | **1 ZB-50** | | |
| | **101314HE\e1j1308.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.234 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.246 | ug/L | 0.006 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.63 | 3.57 | ug/L | 130 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180608** | | | | |
| **Client Sample:** | **QC for batch 1424503** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1424503** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424504** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/13/2014 14:04** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 10:16** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101314HE\e1j1309.D** | **Column:** | **1 ZB-50** | | |
| | **101314HE\e1j1309.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.237 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.247 | ug/L | 0.006 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.63 | 3.57 | ug/L | 130 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180617** | | | | |
| **Client Sample:** | **QC for batch 1424419** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1424419** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424420** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 11:56** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 10:35** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **100614HE\e1j0606.D** | **Column:** | **1 ZB-50** | | |
| | **100614HE\e1j0606.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.26 | 3.57 | ug/L | 119 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203180618** | | | | |
| **Client Sample:** | **QC for batch 1424503** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1424503** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1424504** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/13/2014 13:22** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 10:16** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101314HE\e1j1307.D** | **Column:** | **1 ZB-50** | | |
| | **101314HE\e1j1307.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.95 | 3.57 | ug/L | 111 | (56%-145%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 07-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| GC/ECD | SW846 8011 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1424420 | See Below | | |

**Potentially affected work order(s)(SDG): 357745(2014-4642),357956(2015-17)**

**Application Issues:**

Failed Yield for Surrogates

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Surrogates recovered outside of acceptance limits on one analytical column for samples 357745013 and 357956026. | 1. The recoveries were biased high and no target analytes were detected in the sample; the reported data were not adversely impacted by the surrogate failures. |

**Originator's Name:**

Lindsey Jensen 07-OCT-14

**Data Validator/Group Leader:**

Jimin Cao 08-OCT-14

# PCB Analysis

# Case Narrative

**PCB Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Polychlorinated Biphenyls by ECD** |
| Analytical Method: | SW846 3535A/8082 |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1424177 |
| Prep Batch Number: | 1424176 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

| Sample ID | Client ID |
|---|---|
| 357745002 | CAWR-14-86942 |
| 1203179784 | MB for batch 1424176 |
| 1203179785 | Laboratory Control Sample (LCS) |
| 1203179793 | Laboratory Control Sample Duplicate (LCSD) |
| 1203179792 | 357745002(CAWR-14-86942) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

One of the five quantified peaks did not meet the acceptance criteria in Aroclor-1260 standards analyzed for this SDG; however, the average concentration of the five quantified peaks met the acceptance criteria.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 357745002 (CAWR-14-86942) was selected for the matrix spike analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this batch.

## Miscellaneous Information

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The column 2 has been chosen as the primary column. The data are reported from the column 2 for all samples in this batch. The column 2 has been chosen as the primary column. The data are reported from the column 2 for all samples in this batch.

Due to software issue, the surrogate recovery range was not indicated in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

**System Configuration**

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD8A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide I) |
| ECD8A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642 GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Jimin Cao **Name: Jimin Cao**

**Date: 23 OCT 2014** **Title: Data Validator**

# Sample Data Summary

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745002** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86942** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1424177** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 13:27** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/03/2014 11:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **100614.B\e8j0638.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **100614.B\e8j0638.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11096-82-5 | Aroclor-1260 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.115 | 0.200 | ug/L | 57.7 | (33%-102%) |
| Decachlorobiphenyl | 0.177 | 0.200 | ug/L | 88.5 | (33%-125%) |

# Quality Control Summary

**PCB**

## Surrogate Recovery Report

**SDG Number: 2014-4642**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|---|---|---|---|---|---|
| 1203179784 | MB for batch 1424176 | 76 | 80 | 100 | 99 |
| 1203179785 | LCS for batch 1424176 | 65 | 69 | 85 | 85 |
| 1203179793 | LCSD for batch 1424176 | 59 | 63 | 91 | 91 |
| 357745002 | CAWR-14-86942 | 54 | 58 | 88 | 89 |
| 1203179792 | CAWR-14-86942MS | 63 | 68 | 91 | 96 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 4CMX | = 4cmx | (33%-102%) |
| DCB | = Decachlorobiphenyl | (33%-125%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1424176**
**Lab Sample ID** **1203179785**
**Instrument:** **ECD8A.I**
**Analyst:** **JXM**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/06/2014 12:20**
**Dilution: 1**
**Prep Batch ID:** **1424176**
**Batch ID:** **1424177**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCS | Aroclor-1016 | 1.00 | 0.0 | 0.694 | 69 | 47-105 |
| 11096-82-5 | LCS | Aroclor-1260 | 1.00 | 0.0 | 0.571 | 57 | 45-108 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCSD for batch 1424176**
**Lab Sample ID** **1203179793**
**Instrument:** **ECD8A.I**
**Analyst:** **JXM**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/06/2014 12:32**
**Dilution: 1**
**Prep Batch ID:** **1424176**
**Batch ID:** **1424177**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCSD Aroclor-1016 | 1.00 | 0.0 | 0.652 | 65 | 47-105 | 6 | 0-30 |
| 11096-82-5 | LCSD Aroclor-1260 | 1.00 | 0.0 | 0.581 | 58 | 45-108 | 2 | 0-30 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86942MS**
**Lab Sample ID** **1203179792**
**Instrument:** **ECD8A.I**
**Analyst:** **JXM**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/06/2014 13:42**
**Prep Batch ID:** **1424176**
**Batch ID:** **1424177**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MS | Aroclor-1016 | 1.00 | 0.00 | U | 0.695 | 69 | 32-108 |
| 11096-82-5 | MS | Aroclor-1260 | 1.00 | 0.00 | U | 0.665 | 66 | 29-110 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1424176** | **Instrument ID:** | **ECD8A.I_1**<br>**ECD8A.I_2** | **Data File:** | **100614.B\e8j0632.D**<br>**100614.B\e8j0632.D** |
| **Lab Sample ID:** | **1203179784** | | | | |
| **Column:** | **RTX-CLPEST1**<br>**RTX-CLPEST2** | **Prep Date:** | **10/03/2014 11:30** | **Analyzed:** | **10/06/14 12:07** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1424176** | **1203179785** | **100614.B\e8j0633.D**<br>**100614.B\e8j0633.D** | **10/06/14** | **1220** |
| **02 LCSD for batch 1424176** | **1203179793** | **100614.B\e8j0634.D**<br>**100614.B\e8j0634.D** | **10/06/14** | **1232** |
| **03 CAWR-14-86942** | **357745002** | **100614.B\e8j0638.D**<br>**100614.B\e8j0638.D** | **10/06/14** | **1327** |
| **04 CAWR-14-86942MS** | **1203179792** | **100614.B\e8j0639.D**<br>**100614.B\e8j0639.D** | **10/06/14** | **1342** |

# Quality Control Data

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203179784** | | | | |
| **Client Sample:** | **QC for batch 1424176** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1424176** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1424177** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 12:07** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/03/2014 11:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **100614.B\e8j0632.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **100614.B\e8j0632.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11096-82-5 | Aroclor-1260 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.161 | 0.200 | ug/L | 80.5 | (33%-102%) |
| Decachlorobiphenyl | 0.198 | 0.200 | ug/L | 98.9 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203179785** | | | | |
| **Client Sample:** | **QC for batch 1424176** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1424176** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1424177** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 12:20** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/03/2014 11:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **100614.B\e8j0633.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **100614.B\e8j0633.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.694 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11096-82-5 | Aroclor-1260 | | 0.571 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.137 | 0.200 | ug/L | 68.7 | (33%-102%) |
| Decachlorobiphenyl | 0.170 | 0.200 | ug/L | 85.0 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203179792** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1424176** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86942MS** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1424177** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 13:42** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/03/2014 11:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **100614.B\e8j0639.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **100614.B\e8j0639.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.695 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11096-82-5 | Aroclor-1260 | | 0.665 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.136 | 0.200 | ug/L | 67.8 | (33%-102%) |
| Decachlorobiphenyl | 0.191 | 0.200 | ug/L | 95.6 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203179793** | | | | |
| **Client Sample:** | **QC for batch 1424176** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1424176** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1424177** | **Inst:** | **ECD8A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/06/2014 12:32** | **Analyst:** | **JXM** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/03/2014 11:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **100614.B\e8j0634.D** | **Column:** | **1 RTX-CLPEST1** | | |
| | **100614.B\e8j0634.D** | | **2 RTX-CLPEST2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.652 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |
| 11096-82-5 | Aroclor-1260 | | 0.581 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.126 | 0.200 | ug/L | 62.9 | (33%-102%) |
| Decachlorobiphenyl | 0.182 | 0.200 | ug/L | 90.8 | (33%-125%) |

# Herbicide Analysis

# Case Narrative

**Herbicide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Chlorophenoxy Acid Herbicides by ECD** |
| Analytical Method: | SW846 8151A |
| Prep Method: | SW846 8151A |
| Analytical Batch Number: | 1424174 |
| Prep Batch Number: | 1424173 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8151A:

| Sample ID | Client ID |
|---|---|
| 357745008 | CAWR-14-86892 |
| 357745012 | CAWR-14-86943 |
| 1203179779 | MB for batch 1424173 |
| 1203179780 | Laboratory Control Sample (LCS) |
| 1203179783 | Laboratory Control Sample Duplicate (LCSD) |
| 1203179781 | 357826004(CAWR-14-86888) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-011 REV# 21.

Raw data reports are processed and reviewed by the analyst using ChemStation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All Initial Calibration Verification (ICV) requirements have been met for this SDG. However, not all Calibration Verification Standards (CCV) requirements were met. Pentachlorophenol failed acceptance criteria with a positive bias on one or both analytical columns in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. Since the target analyte was not detected in the samples, the non-compliance had no adverse impact on the data. All

analytes were within the established retention time windows for this method.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
The LCSD(1203179783) did not meet surrogate recovery acceptance criteria. Since there were no target analytes detected in the associated client samples, the biased high recovery had no adverse impact on the reported data results.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD(s) between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 357826004 (CAWR-14-86888) was selected for analysis as the matrix spike. A matrix spike duplicate was not extracted or analyzed with this batch. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
There was no matrix spike duplicate extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**MS/MSD Relative Percent Difference (RPD) Statement**
There are no reportable MS/MSD RDP values since a MSD was not extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported target analyte concentrations were confirmed on a dissimilar column.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or

dilutions were required.

**Miscellaneous Information**

**Electronic Package Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1341699.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this Herbicide fraction.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the LCSD are from the same analytical column as the LCS. The data reported for the MS are from the same analytical column as the parent sample.

Due to rounding differences in the calculation between the forms, the data reported in the Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**System Configuration**

The Semi-Volatiles-HERB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD3A.I_1 | Agilent 7890A GC with duel uECD | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD3A.I_2 | Agilent 7890A GC with duel uECD | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticideII) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 26 OCT 2014**  **Title: Data Validator**

# Sample Data Summary

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 10:21** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745008** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86892** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1424174** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 16:23** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 05:15** | **Aliquot:** | **970 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **100714\e3j0716.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **100714\e3j0716.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.258 | ug/L | 0.0859 | 0.258 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 2.93 | 5.15 | ug/L | 56.8 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/29/2014 12:20** | **Matrix:** | **W** |
| **Lab Sample ID:** | **357745012** | **Date Received:** | **10/01/2014 09:00** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86943** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1424174** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 16:43** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 05:15** | **Aliquot:** | **980 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **100714\e3j0717.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **100714\e3j0717.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.255 | ug/L | 0.085 | 0.255 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.24 | 5.10 | ug/L | 103 | (40%-138%) |

# Quality Control Summary

**Herbicide**

**Surrogate Recovery Report**

**SDG Number: 2014-4642**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCAA 1 %REC # | DCAA 2 %REC # |
|---|---|---|---|
| 1203179779 | MB for batch 1424173 | 91 | 92 |
| 1203179780 | LCS for batch 1424173 | 93 | 132 |
| 1203179783 | LCSD for batch 1424173 | 106 | 150 * |
| 357745008 | CAWR-14-86892 | 57 | 57 |
| 357745012 | CAWR-14-86943 | 95 | 103 |
| 1203179781 | CAWR-14-86888MS | 85 | 88 |

| Surrogate | Acceptance Limits |
|---|---|
| DCAA = 2,4-Dichlorophenylacetic acid | (40%-138%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCS for batch 1424173**
**Lab Sample ID** **1203179780**
**Instrument:** **ECD3A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/07/2014 12:47**
**Prep Batch ID:** **1424173**
**Batch ID:** **1424174**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 87-86-5 | LCS | Pentachlorophenol | 2.00 | 0.0 | 2.05 | 102 | 55-113 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **LCSD for batch 1424173**
**Lab Sample ID** **1203179783**
**Instrument:** **ECD3A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/07/2014 13:06**
**Dilution: 1**
**Prep Batch ID:** **1424173**
**Batch ID:** **1424174**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | LCSD Pentachlorophenol | 2.00 | 0.0 | 2.24 | 112 | 55-113 | 9 | 0-30 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2014-4642**
**Client ID:** **CAWR-14-86888MS**
**Lab Sample ID** **1203179781**
**Instrument:** **ECD3A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/07/2014 17:46**
**Prep Batch ID:** **1424173**
**Batch ID:** **1424174**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | MS | Pentachlorophenol | 2.22 | 0.00 | U | 1.91 | 86 | 24-119 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1424173** | **Instrument ID:** | **ECD3A.I_1**<br>**ECD3A.I_2** | **Data File:** | **100714\e3j0704.D**<br>**100714\e3j0704.D** |
| **Lab Sample ID:** | **1203179779** | | | | |
| **Column:** | **RTX-CLPEST 1**<br>**RTX-CLPEST 2** | **Prep Date:** | **10/06/2014 05:15** | **Analyzed:** | **10/07/14 12:27** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1424173** | **1203179780** | **100714\e3j0705.D**<br>**100714\e3j0705.D** | **10/07/14** | **1247** |
| **02 LCSD for batch 1424173** | **1203179783** | **100714\e3j0706.D**<br>**100714\e3j0706.D** | **10/07/14** | **1306** |
| **03 CAWR-14-86892** | **357745008** | **100714\e3j0716.D**<br>**100714\e3j0716.D** | **10/07/14** | **1623** |
| **04 CAWR-14-86943** | **357745012** | **100714\e3j0717.D**<br>**100714\e3j0717.D** | **10/07/14** | **1643** |
| **05 CAWR-14-86888MS** | **1203179781** | **100714\e3j0719.D**<br>**100714\e3j0719.D** | **10/07/14** | **1746** |

# Quality Control Data

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203179779** | | | | |
| **Client Sample:** | **QC for batch 1424173** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1424173** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1424174** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 12:27** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 05:15** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **100714\e3j0704.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **100714\e3j0704.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.250 | ug/L | 0.0833 | 0.250 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.60 | 5.00 | ug/L | 92.0 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203179780** | | | | |
| **Client Sample:** | **QC for batch 1424173** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1424173** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1424174** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 12:47** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 05:15** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **100714\e3j0705.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **100714\e3j0705.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 2.05 | ug/L | 0.0833 | 0.250 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 6.62 | 5.00 | ug/L | 132 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | **Date Collected:** | **09/30/2014 17:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203179781** | **Date Received:** | **10/02/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1424173** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86888MS** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1424174** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 17:46** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 05:15** | **Aliquot:** | **900 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **100714\e3j0719.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **100714\e3j0719.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.91 | ug/L | 0.0926 | 0.278 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.91 | 5.56 | ug/L | 88.4 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2014-4642** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203179783** | | | | |
| **Client Sample:** | **QC for batch 1424173** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1424173** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1424174** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/07/2014 13:06** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/06/2014 05:15** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **100714\e3j0706.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **100714\e3j0706.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 2.24 | ug/L | 0.0833 | 0.250 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | | Acceptable Limits |
|---|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 7.51 | 5.00 | ug/L | 150 | * | (40%-138%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 08-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| GC/ECD | SW846 8151A | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1424174 | See Below | | |

**Potentially affected work order(s)(SDG): 357742(2014-4645),357745(2014-4642),357826(2015-8)**

**Application Issues:**

Failed Yield for Surrogates

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The LCSD(1203179783) did not meet surrogate recovery acceptance criteria. | 1. Since there were no target analytes detected in the associated client samples, the biased high recovery had no adverse impact on the reported data results. |

**Originator's Name:**

Lindsey Jensen 08-OCT-14

**Data Validator/Group Leader:**

Barbara Bailey 13-OCT-14

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

| **Sample ID** | **Client ID** |
|---|---|
| 357745003 | CAWR-14-86942 |
| 357745004 | CAWR-14-86969 |
| 1203178254 | Method Blank (MB)**ICP** |
| 1203178255 | Laboratory Control Sample (LCS) |
| 1203178258 | 357745004(CAWR-14-86969L) Serial Dilution (SD) |
| 1203178256 | 357745004(CAWR-14-86969D) Sample Duplicate (DUP) |
| 1203178257 | 357745004(CAWR-14-86969S) Matrix Spike (MS) |
| 1203178249 | Method Blank (MB)**ICP-MS** |
| 1203178250 | Laboratory Control Sample (LCS) |
| 1203178253 | 357745004(CAWR-14-86969L) Serial Dilution (SD) |
| 1203178251 | 357745004(CAWR-14-86969D) Sample Duplicate (DUP) |
| 1203178252 | 357745004(CAWR-14-86969S) Matrix Spike (MS) |
| 1203179971 | Method Blank (MB)**CVAA** |
| 1203179972 | Laboratory Control Sample (LCS) |
| 1203179975 | 357745003(CAWR-14-86942L) Serial Dilution (SD) |
| 1203179973 | 357745003(CAWR-14-86942D) Sample Duplicate (DUP) |
| 1203179974 | 357745003(CAWR-14-86942S) Matrix Spike (MS) |

**Sample Analysis**

**Method/Analysis Information**

| | |
|---|---|
| **Analytical Batch:** | 1423534, 1423529, 1424248 and 1431368 |
| **Prep Batch :** | 1423533, 1423528 and 1424247 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 11, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 28 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**System Configuration**

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1600W power, 16 L/m for the plasma, and 1.2 L/m auxiliary gases, and 1.12 L/min carrier gas flow.

**Calibration Information**

**Instrument Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL/PQL Requirements**
The CRDL/PQL standard recoveries met the referenced advisory control limits.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blanks (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 357745004 (CAWR-14-86969)-ICP and ICP-MS and 357745003 (CAWR-14-86942)-CVAA.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20%

when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

**Preparation Information**
The samples in this SDG were prepared exactly according to the cited SOP.

**Miscellaneous Information**

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

**Additional Comments**
Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both

results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:** 10/28/14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____ 10/28/14

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−4642 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 357745003 **BASIS:** As Received **DATE COLLECTED** 29−SEP−14

**CLIENT ID:** CAWR−14−86942 **LEVEL:** Low **DATE RECEIVED** 01−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/06/14 10:10 | 100614W1−3 | 1424248 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1424248 | 1424247 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/03/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−4642 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 357745004 **BASIS:** As Received **DATE COLLECTED** 29−SEP−14

**CLIENT ID:** CAWR−14−86969 **LEVEL:** Low **DATE RECEIVED** 01−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/06/14 10:28 | 100614W1−3 | 1424248 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2014−4642 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 357745004 **BASIS:** As Received **DATE COLLECTED** 29−SEP−14

**CLIENT ID:** CAWR−14−86969 **LEVEL:** Low **DATE RECEIVED** 01−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−38−2 | Arsenic | 5.51 | ug/L | | 1.7 | 5 | 5 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−39−3 | Barium | 21.9 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−42−8 | Boron | 38.5 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−70−2 | Calcium | 15400 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−47−3 | Chromium | 5.38 | ug/L | J | 2 | 10 | 10 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7439−95−4 | Magnesium | 993 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7439−98−7 | Molybdenum | 2.61 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−02−0 | Nickel | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−09−7 | Potassium | 2080 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7631−86−9 | Silica | 32900 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−23−5 | Sodium | 31800 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−24−6 | Strontium | 199 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−31−5 | Tin | 10 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−61−1 | Uranium | 1.84 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 10/23/14 20:20 | 141023−2 | 1423529 |
| 7440−62−2 | Vanadium | 16.8 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 10/08/14 09:22 | 100814−1 | 1423534 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2014−4642 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 357745004 **BASIS:** As Received **DATE COLLECTED** 29−SEP−14

**CLIENT ID:** CAWR−14−86969 **LEVEL:** Low **DATE RECEIVED** 01−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 42.7 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 10/28/14 13:14 | | 1431368 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1423529 | 1423528 | SW846 3005A | 50 | mL | 50 | mL | 10/01/14 | 1 |
| 1423534 | 1423533 | SW846 3005A | 50 | mL | 50 | mL | 10/07/14 | KXP3 |
| 1424248 | 1424247 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/03/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2014−4642

**Contract:** ESHL00714

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203178249 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203178254 | | | | | | | | |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 50 | ug/L | +/−150 | U | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 100 | ug/L | +/−300 | U | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| 1203179971 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−4642 **Client ID** CAWR−14−86969S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 357745004 **Spike ID:** 1203178252

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | 75−125 | 51.1 | | 1 | U | 50 | 102 | | MS |
| Arsenic | ug/L | 75−125 | 61.5 | | 5.51 | | 50 | 112 | | MS |
| Cadmium | ug/L | 75−125 | 51.9 | | 0.11 | U | 50 | 104 | | MS |
| Chromium | ug/L | 75−125 | 56.9 | | 5.38 | J | 50 | 103 | | MS |
| Lead | ug/L | 75−125 | 49.9 | | 0.5 | U | 50 | 99.7 | | MS |
| Molybdenum | ug/L | 75−125 | 55.5 | | 2.61 | | 50 | 106 | | MS |
| Nickel | ug/L | 75−125 | 51.6 | | 0.5 | U | 50 | 103 | | MS |
| Selenium | ug/L | 75−125 | 52.8 | | 1.5 | U | 50 | 105 | | MS |
| Silver | ug/L | 75−125 | 52.9 | | 0.2 | U | 50 | 106 | | MS |
| Thallium | ug/L | 75−125 | 46.8 | | 0.45 | U | 50 | 93.6 | | MS |
| Uranium | ug/L | 75−125 | 49.1 | | 1.84 | | 50 | 94.6 | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−4642 **Client ID** CAWR−14−86969S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 357745004 **Spike ID:** 1203178257

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 5240 | | 68 | U | 5000 | 105 | | P |
| Barium | ug/L | 75−125 | 525 | | 21.9 | | 500 | 101 | | P |
| Beryllium | ug/L | 75−125 | 499 | | 1 | U | 500 | 99.7 | | P |
| Boron | ug/L | 75−125 | 536 | | 38.5 | J | 500 | 99.5 | | P |
| Calcium | ug/L | 75−125 | 20500 | | 15400 | | 5000 | 102 | | P |
| Cobalt | ug/L | 75−125 | 496 | | 1 | U | 500 | 99.1 | | P |
| Copper | ug/L | 75−125 | 514 | | 3 | U | 500 | 103 | | P |
| Strontium | ug/L | 75−125 | 712 | | 199 | | 500 | 103 | | P |
| Tin | ug/L | 75−125 | 504 | | 2.5 | U | 500 | 101 | | P |
| Vanadium | ug/L | 75−125 | 538 | | 16.8 | | 500 | 104 | | P |
| Zinc | ug/L | 75−125 | 516 | | 3.3 | U | 500 | 103 | | P |
| Iron | ug/L | 75−125 | 5200 | | 30 | U | 5000 | 104 | | P |
| Magnesium | ug/L | 75−125 | 6170 | | 993 | | 5000 | 103 | | P |
| Manganese | ug/L | 75−125 | 499 | | 2 | U | 500 | 99.5 | | P |
| Potassium | ug/L | 75−125 | 7210 | | 2080 | | 5000 | 103 | | P |
| Silica | ug/L | 75−125 | 42700 | | 32900 | | 10700 | 91.1 | | P |
| Sodium | ug/L | | 36800 | | 31800 | | 5000 | 99.3 | N/A | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2014−4642 **Client ID** CAWR−14−86942S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 357745003 **Spike ID:** 1203179974

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 2.09 | | 0.067 | U | 2 | 104 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−4642 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CAWR−14−86969D

**Matrix:** WATER **Level:** Low

**Sample ID:** 357745004 **Duplicate ID:** 1203178251 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | +/−5 | 5.51 | | 5.21 | | 5.45 | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | +/−10 | 5.38 | J | 5.47 | J | 1.66 | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−20% | 2.61 | | 2.62 | | .267 | | MS |
| Nickel | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−20% | 1.84 | | 1.83 | | .981 | | MS |

***Analytical Methods:**

**MS SW846 3005A/6020A**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−4642 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CAWR−14−86969D

**Matrix:** WATER **Level:** Low

**Sample ID:** 357745004 **Duplicate ID:** 1203178256 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−5 | 21.9 | | 21.7 | | .982 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | +/−50 | 38.5 | J | 37.6 | J | 2.37 | | P |
| Calcium | ug/L | +/−20% | 15400 | | 15200 | | 1.53 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−300 | 993 | | 978 | | 1.47 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 2080 | | 2060 | | 1.18 | | P |
| Silica | ug/L | +/−20% | 32900 | | 32400 | | 1.73 | | P |
| Sodium | ug/L | +/−20% | 31800 | | 31500 | | 1.24 | | P |
| Strontium | ug/L | +/−20% | 199 | | 197 | | 1.44 | | P |
| Tin | ug/L | | 2.5 | U | 2.5 | U | | | P |
| Vanadium | ug/L | +/−5 | 16.8 | | 16.7 | | .668 | | P |
| Zinc | ug/L | | 3.3 | U | 3.3 | U | | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2014−4642 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CAWR−14−86942D

**Matrix:** WATER **Level:** Low

**Sample ID:** 357745003 **Duplicate ID:** 1203179973 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−4642

**Contract:** ESHL00714

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203178250 | | | | | | | | |
| | Antimony | ug/L | 50 | 50.7 | | 101 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 54.7 | | 109 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 51.1 | | 102 | 80−120 | MS |
| | Chromium | ug/L | 50 | 51.3 | | 103 | 80−120 | MS |
| | Lead | ug/L | 50 | 50.8 | | 102 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 51.3 | | 103 | 80−120 | MS |
| | Nickel | ug/L | 50 | 51.4 | | 103 | 80−120 | MS |
| | Selenium | ug/L | 50 | 51.8 | | 104 | 80−120 | MS |
| | Silver | ug/L | 50 | 53.3 | | 107 | 80−120 | MS |
| | Thallium | ug/L | 50 | 47.8 | | 95.5 | 80−120 | MS |
| | Uranium | ug/L | 50 | 46.4 | | 92.8 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−4642

**Contract:** ESHL00714

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203178255 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 5150 | | 103 | 80−120 | P |
| | Barium | ug/L | 500 | 504 | | 101 | 80−120 | P |
| | Beryllium | ug/L | 500 | 491 | | 98.3 | 80−120 | P |
| | Boron | ug/L | 500 | 489 | | 97.7 | 80−120 | P |
| | Calcium | ug/L | 5000 | 5040 | | 101 | 80−120 | P |
| | Cobalt | ug/L | 500 | 501 | | 100 | 80−120 | P |
| | Copper | ug/L | 500 | 506 | | 101 | 80−120 | P |
| | Iron | ug/L | 5000 | 5150 | | 103 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 5180 | | 104 | 80−120 | P |
| | Manganese | ug/L | 500 | 507 | | 101 | 80−120 | P |
| | Potassium | ug/L | 5000 | 5100 | | 102 | 80−120 | P |
| | Silica | ug/L | 10700 | 10400 | | 96.9 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5230 | | 105 | 80−120 | P |
| | Strontium | ug/L | 500 | 505 | | 101 | 80−120 | P |
| | Tin | ug/L | 500 | 512 | | 102 | 80−120 | P |
| | Vanadium | ug/L | 500 | 518 | | 104 | 80−120 | P |
| | Zinc | ug/L | 500 | 512 | | 102 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2014−4642

**Contract:** ESHL00714

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203179972 | | | | | | | | |
| | Mercury | ug/L | 2 | 2.1 | | 105 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−4642 **Client ID** CAWR−14−86969L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 357745004 **Serial Dilution ID:** 1203178253

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 5.51 | | 8.5 | U | 100 | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 5.38 | J | 10 | U | 100 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | 2.61 | | 2.6 | | .727 | | | MS |
| Nickel | .5 | U | 2.5 | U | | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | 1.84 | | 1.69 | | 8.35 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−4642 **Client ID** CAWR−14−86969L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 357745004 **Serial Dilution ID:** 1203178258

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 21.9 | | 21.6 | J | 1.43 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 38.5 | J | 75 | U | 100 | | | P |
| Calcium | 15400 | | 15400 | | .418 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 993 | | 1010 | J | 1.66 | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 2080 | | 2260 | | 8.79 | | | P |
| Silica | 32900 | | 32100 | | 2.58 | | 10 | P |
| Sodium | 31800 | | 32100 | | .876 | | 10 | P |
| Strontium | 199 | | 198 | | .604 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 16.8 | | 16.9 | J | .666 | | | P |
| Zinc | 3.3 | U | 16.5 | U | | | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2014−4642 **Client ID** CAWR−14−86942L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 357745003 **Serial Dilution ID:** 1203179975

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1425465 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203182974 | Method Blank (MB) |
| 1203182975 | Laboratory Control Sample (LCS) |
| 1203182976 | 357956016(CAWR-14-86951) Sample Duplicate (DUP) |
| 1203182977 | 357956016(CAWR-14-86951) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 357956016 (CAWR-14-86951).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203182976 (CAWR-14-86951).

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
A 15 mg/L Total Inorganic Carbon check standard is analyzed with each analytical run to prove that the instrument is effectively sparging away the inorganic carbon.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages

electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1424679 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1424677 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203181018 | Method Blank (MB) |
| 1203181019 | Laboratory Control Sample (LCS) |
| 1203181020 | 357745003(CAWR-14-86942) Sample Duplicate (DUP) |
| 1203181021 | 357956002(CAWR-14-86945) Sample Duplicate (DUP) |
| 1203181022 | 357745003(CAWR-14-86942) Matrix Spike (MS) |
| 1203181023 | 357956002(CAWR-14-86945) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 357745003 (CAWR-14-86942) and 357956002 (CAWR-14-86945).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203181020 (CAWR-14-86942) and 1203181021 (CAWR-14-86945).

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1425103 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203182075 | Method Blank (MB) |
| 1203182076 | Laboratory Control Sample (LCS) |
| 1203182077 | 357390009(WST63-14-87514) Sample Duplicate (DUP) |
| 1203182078 | 357390009(WST63-14-87514) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 357390009 (WST63-14-87514).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Manual integrations were not required for the samples in this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will

always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1424400 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1424399 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203180363 | Method Blank (MB) |
| 1203180364 | Laboratory Control Sample (LCS) |
| 1203180367 | 357956003(CAWR-14-86972) Sample Duplicate (DUP) |
| 1203180368 | 357956003(CAWR-14-86972) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203180363 (MB).

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 357956003 (CAWR-14-86972).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203180368 (CAWR-14-86972).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203180367 (CAWR-14-86972).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported. 1203180363 (MB).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1342541. 1203180367 (CAWR-14-86972) and 1203180368 (CAWR-14-86972).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1423718 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1423716 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203178663 | Method Blank (MB) |
| 1203178664 | Laboratory Control Sample (LCS) |
| 1203178665 | 357745003(CAWR-14-86942) Sample Duplicate (DUP) |
| 1203178666 | 357745003(CAWR-14-86942) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 357745003 (CAWR-14-86942).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203178665 (CAWR-14-86942).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203178664 (LCS).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Method/Analysis Information**

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1423722 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| Sample ID | Client ID |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203178678 | Method Blank (MB) |
| 1203178679 | Laboratory Control Sample (LCS) |
| 1203178680 | 357745004(CAWR-14-86969) Sample Duplicate (DUP) |
| 1203178681 | 357745004(CAWR-14-86969) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**Calibration Information**

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 357745004 (CAWR-14-86969).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1423721 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1423719 | **Method:** | EEPA 365.4 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203178674 | Method Blank (MB) |
| 1203178675 | Laboratory Control Sample (LCS) |
| 1203178676 | 357745004(CAWR-14-86969) Sample Duplicate (DUP) |
| 1203178677 | 357745004(CAWR-14-86969) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 357745004 (CAWR-14-86969).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203178676 (CAWR-14-86969).

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will

always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1423636 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203178477 | Method Blank (MB) |
| 1203178478 | Laboratory Control Sample (LCS) |
| 1203178479 | 357745004(CAWR-14-86969) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 357745004 (CAWR-14-86969).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1423966 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| **Sample ID** | **Client ID** |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203179265 | Laboratory Control Sample (LCS) |
| 1203179267 | 357745004(CAWR-14-86969) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
N/A

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1424028 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203179440 | Laboratory Control Sample (LCS) |
| 1203179442 | 357316001(WST55-14-87515) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a Thermo Orion Star A111. Immediates

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
N/A

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1341147. 1203179442 (WST55-14-87515) and 357745004 (CAWR-14-86969).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1424179 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 357745004 | CAWR-14-86969 |
| 1203179812 | Method Blank (MB) |
| 1203179814 | Laboratory Control Sample (LCS) |
| 1203179818 | 357390009(WST63-14-87514) Sample Duplicate (DUP) |
| 1203179822 | 357390009(WST63-14-87514) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 357390009 (WST63-14-87514).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____28Oct14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

H  Analytical holding time was exceeded

J  Value is estimated

P  Organics--The concentrations between the primary and confirmation columns/detectors is >40% different.  For HPLC, the difference is >70%.

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: October 27, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2014-4642

Client Sample ID: CAWR-14-86942
Sample ID: 357745003
Matrix: W
Collect Date: 29-SEP-14 10:21
Receive Date: 01-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | J | 0.333 | 0.330 | 1.00 | mg/L | 1 | TSM | 10/09/14 | 0139 | 1425465 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 10/08/14 | 1029 | 1424679 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1 | KLP1 | 10/07/14 | 1015 | 1423718 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 10/08/14 | 1015 | 1424677 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 10/06/14 | 1800 | 1423716 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: October 27, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2014-4642

Client Sample ID: CAWR-14-86969
Sample ID: 357745004
Matrix: W
Collect Date: 29-SEP-14 10:21
Receive Date: 01-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | 1 | MAR1 | 10/11/14 | 0032 | 1425103 | 1 |
| Chloride | | 2.99 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.532 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 6.57 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | J | 0.0327 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/09/14 | 1549 | 1424400 | 2 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.380 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/07/14 | 1520 | 1423722 | 3 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/08/14 | 1027 | 1423721 | 4 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 171 | 3.40 | 14.3 | mg/L | | MXB3 | 10/02/14 | 1445 | 1423636 | 5 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 15.9C | H | 7.59 | 0.010 | 0.100 | SU | 1 | PXO1 | 10/04/14 | 1510 | 1424028 | 6 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 96.9 | 0.725 | 1.00 | mg/L | | PXO1 | 10/05/14 | 1353 | 1424179 | 7 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 203 | 3.63 | 14.5 | umhos/cm | 1 | PXO1 | 10/03/14 | 1309 | 1423966 | 8 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 10/09/14 | 1407 | 1424399 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 10/07/14 | 1700 | 1423719 |

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## Certificate of Analysis

Report Date: October 27, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2014-4642 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-86969 | Project: | ESHL00714 |
| Sample ID: | 357745004 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 350.1 | |
| 3 | EPA 353.2 | |
| 4 | EPA 365.4 | |
| 5 | EPA 160.1 | |
| 6 | EPA 150.1 | |
| 7 | EPA 310.1 | |
| 8 | EPA 120.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: October 27, 2014



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **357745**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | |
| Batch 1425465 | | | | | | | | | | | |
| QC1203182976 357956016 DUP | | | | | | | | | | | |
| Total Organic Carbon Average | | J | 0.373 | U | ND | mg/L | 200 ^ | | | TSM | 10/09/14 03:53 |
| QC1203182975 LCS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 9.98 | mg/L | | 99.8 | (85%-115%) | | 10/09/14 04:49 |
| QC1203182974 MB | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | 10/09/14 04:40 |
| QC1203182977 357956016 PS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | J | 0.373 | | 10.9 | mg/L | | 105 | (65%-120%) | | 10/09/14 04:13 |
| **Flow Injection Analysis** | | | | | | | | | | | |
| Batch 1424679 | | | | | | | | | | | |
| QC1203181020 357745003 DUP | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | AXH3 | 10/08/14 10:30 |
| QC1203181021 357956002 DUP | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | | 10/08/14 10:32 |
| QC1203181019 LCS | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 52.5 | ug/L | | 105 | (90%-110%) | | 10/08/14 10:28 |
| QC1203181018 MB | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | 10/08/14 10:27 |
| QC1203181022 357745003 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 108 | ug/L | | 108 | (90%-110%) | | 10/08/14 10:31 |
| QC1203181023 357956002 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 101 | ug/L | | 101 | (90%-110%) | | 10/08/14 10:33 |
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1425103 | | | | | | | | | | | |
| QC1203182077 357390009 DUP | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | MAR1 | 10/10/14 23:33 |
| Chloride | | | 4.80 | | 4.81 | mg/L | 0.0479 | | (0%-20%) | | |
| Fluoride | | | 0.333 | | 0.320 | mg/L | 3.92 ^ | | (+/-0.100) | | |
| Sulfate | | | 3.50 | | 3.57 | mg/L | 2.15 | | (0%-20%) | | |

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## QC Summary

**Workorder:** **357745**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1425103 | | | | | | | | | | | |
| QC1203182076 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.24 | mg/L | | 99.1 | (90%-110%) | MAR1 | 10/11/14 02:32 |
| Chloride | 5.00 | | | | 4.66 | mg/L | | 93.3 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.33 | mg/L | | 93 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 9.44 | mg/L | | 94.4 | (90%-110%) | | |
| QC1203182075 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 10/11/14 02:02 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203182078 357390009 PS | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.26 | mg/L | | 101 | (90%-110%) | | 10/11/14 00:02 |
| Chloride | 5.00 | | 4.80 | | 10.0 | mg/L | | 104 | (90%-110%) | | |
| Fluoride | 2.50 | | 0.333 | | 2.65 | mg/L | | 92.6 | (90%-110%) | | |
| Sulfate | 10.0 | | 3.50 | | 13.3 | mg/L | | 97.8 | (90%-110%) | | |
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1423718 | | | | | | | | | | | |
| QC1203178665 357745003 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | | KLP1 | 10/07/14 10:15 |
| QC1203178664 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 1.08 | mg/L | | 108 | (90%-110%) | | 10/07/14 10:25 |
| QC1203178663 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | U | ND | mg/L | | | | | 10/07/14 10:13 |
| QC1203178666 357745003 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 0.997 | mg/L | | 98 | (90%-110%) | | 10/07/14 10:16 |
| Batch 1423721 | | | | | | | | | | | |
| QC1203178676 357745004 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | U | ND | U | ND | mg/L | N/A | | | KLP1 | 10/08/14 10:28 |
| QC1203178675 LCS | | | | | | | | | | | |

## QC Summary

**Workorder:** **357745**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1423721 | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 0.997 | mg/L | | 99.7 | (83%-123%) | | 10/08/14 10:24 |
| QC1203178674 MB | | | | | | | | | | | |
| Phosphorus, Total as P | | | | U | ND | mg/L | | | | KLP1 | 10/08/14 10:23 |
| QC1203178677 357745004 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | U | ND | | 0.955 | mg/L | | 94.9 | (59%-141%) | | 10/08/14 10:28 |
| Batch 1423722 | | | | | | | | | | | |
| QC1203178680 357745004 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 0.380 | | 0.381 | mg/L | 0.263 | | (0%-20%) | KLP1 | 10/07/14 15:22 |
| QC1203178679 LCS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 1.07 | mg/L | | 107 | (90%-110%) | | 10/07/14 15:15 |
| QC1203178678 MB | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | | U | ND | mg/L | | | | | 10/07/14 15:13 |
| QC1203178681 357745004 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.380 | | 1.48 | mg/L | | 110 | (90%-110%) | | 10/07/14 15:23 |
| Batch 1424400 | | | | | | | | | | | |
| QC1203180367 357956003 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | J | 0.0402 | | 0.154 | mg/L | 117*^ | | (+/-0.050) | KLP1 | 10/09/14 16:05 |
| QC1203180364 LCS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 0.970 | mg/L | | 97 | (90%-110%) | | 10/09/14 15:44 |
| QC1203180363 MB | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | J | 0.0373 | mg/L | | | | | 10/09/14 15:43 |
| QC1203180368 357956003 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | J | 0.0402 | | 1.15 | mg/L | | 111* | (90%-110%) | | 10/09/14 16:06 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1423636 | | | | | | | | | | | |
| QC1203178479 357745004 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 171 | | 173 | mg/L | 0.830 | | (0%-10%) | MXB3 | 10/02/14 14:45 |
| QC1203178478 LCS | | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | | 293 | mg/L | | 97.6 | (95%-105%) | | 10/02/14 14:45 |
| QC1203178477 MB | | | | | | | | | | | |
| Total Dissolved Solids | | | | U | ND | mg/L | | | | | 10/02/14 14:45 |
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1423966 | | | | | | | | | | | |

## QC Summary

**Workorder:** **357745**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1423966 | | | | | | | | | | | |
| QC1203179267 357745004 DUP | | | | | | | | | | | |
| Conductivity | | | 203 | | 204 | umhos/cm | 0.480 | | (0%-10%) | PXO1 | 10/03/14 13:11 |
| QC1203179265 LCS | | | | | | | | | | | |
| Conductivity | 1410 | | | | 1380 | umhos/cm | | 98 | (95%-105%) | | 10/03/14 13:04 |
| Batch 1424028 | | | | | | | | | | | |
| QC1203179442 357316001 DUP | | | | | | | | | | | |
| pH | | H | 8.42 | H | 8.39 | SU | 0.357 | | (0%-5%) | PXO1 | 10/04/14 14:58 |
| QC1203179440 LCS | | | | | | | | | | | |
| pH | 7.00 | | | | 6.95 | SU | | 99.3 | (99%-101%) | | 10/04/14 14:44 |
| Batch 1424179 | | | | | | | | | | | |
| QC1203179818 357390009 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | 75.8 | | 76.3 | mg/L | 0.660 | | (0%-20%) | PXO1 | 10/05/14 13:29 |
| Carbonate alkalinity (CaCO3) | | U | ND | U | ND | mg/L | N/A | | | | |
| QC1203179814 LCS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | | 50.2 | mg/L | | 100 | (90%-110%) | | 10/05/14 13:08 |
| QC1203179812 MB | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | | U | ND | mg/L | | | | | 10/05/14 13:08 |
| Carbonate alkalinity (CaCO3) | | | | U | ND | mg/L | | | | | |
| QC1203179822 357390009 MS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | 75.8 | | 126 | mg/L | | 100 | (80%-120%) | | 10/05/14 13:31 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |

## QC Summary

**Workorder:** **357745**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 07-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ELECTRODE | See Below | Liquid | BARR, ESHL, GELC, INPA, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1424028 | See Below | | |

**Potentially affected work order(s)(SDG): 357225,357275,357316(2014-4606),357724,357745(2014-4642),357786,357820**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| Test/Methods: EPA 150.1, SM 4500-H B, SW846 9040B/9040C, SW846 9040C<br><br>1. Sample received out of holding:<br><br>357225 001<br><br>357275 021,022,023,024<br><br>357316 001<br><br>357724 001,002,003<br><br>357745 004<br><br>357786 001<br><br>357820 001,002,003,004,005,006,007 | 1. Samples were received and analyzed outside of method specified holding time. |

**Originator's Name:**

Patrick Orgel 07-OCT-14

**Data Validator/Group Leader:**

Elzbieta Szulc 07-OCT-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 10-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 350.1, EPA 350.1 SC | Liquid | ECWS, ESHL, EXEL, GSTL, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1424400 | See Below | | |

**Potentially affected work order(s)(SDG): 357481,357745(2014-4642),357788,357860,357862,357928,357943,357950,357956(2015-17),357996**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br>QC 1203180366MS,1203180368MS,<br>1203180370MS<br>2. Failed RPD for DUP:<br>QC 1203180367DUP | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference.<br>1203180368<br>The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.<br>1203180366 and 1203180370<br>2. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 10-OCT-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 10-OCT-14

# Radiological Analysis

**Radiochemistry Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2014-4642**
**Work Order 357745**

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Pu, Liquid** |
| Analytical Method: | DOE EML HASL-300, Pu-11-RC Modified |
| Analytical Batch Number: | 1423583 |

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203178349 | MB for batch 1423583 |
| 1203178351 | Laboratory Control Sample (LCS) |
| 1203178350 | 357745003(CAWR-14-86942) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in September 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203178349 (MB) and 1203178351 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 357745003 (CAWR-14-86942). The QC was from ARSL work order 357745.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec U, Liquid** |
| Analytical Method: | DOE EML HASL-300, U-02-RC Modified |
| Analytical Batch Number: | 1423584 |

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203178352 | MB for batch 1423584 |
| 1203178354 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in September 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203178352 (MB) and 1203178354 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 357745003 (CAWR-14-86942). The QC was from ARSL work order 357745.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Am241 Liquid** |
| Analytical Method: | DOE EML HASL-300, Am-05-RC Modified |
| Analytical Batch Number: | 1427568 |

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203188103 | MB for batch 1427568 |
| 1203188105 | Laboratory Control Sample (LCS) |
| 1203188104 | 357745003(CAWR-14-86942) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibrations were performed in October 2014 and September 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203188103 (MB) and 1203188105 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 357745003 (CAWR-14-86942). The QC was from ARSL work order 357745.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
Samples were reprepped due to low carrier/tracer yield. The re-analysis is being reported.

**Recounts**
Samples 1203188103 (MB), 1203188104 (CAWR-14-86942) and 357745003 (CAWR-14-86942) were recounted due to high MDCs. The recounts are reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population. Samples 1203188103 (MB), 1203188104 (CAWR-14-86942) and 357745003 (CAWR-14-86942) did not meet the client's yield requirement. However, there are 400 tracer counts, GEL's standard tracer yield requirements are met, and the client's detection limits are met.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Gammaspec** |
| Analytical Method: | EPA 901.1 |
| Analytical Batch Number: | 1423982 |

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203179287 | MB for batch 1423982 |
| 1203179289 | Laboratory Control Sample (LCS) |
| 1203179288 | 357745003(CAWR-14-86942) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibrations were performed in July 2014, March 2014 and September 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
The blank volume is representative of the sample volume in this batch.

**Designated QC**
The following sample was used for QC: 357745003 (CAWR-14-86942). The QC was from ARSL work order 357745.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
Additional comments were not required for this sample set.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **GFPC, Sr90, liquid** |
| Analytical Method: | EPA 905.0 Modified |
| Analytical Batch Number: | 1424874 |

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203181456 | MB for batch 1424874 |
| 1203181459 | Laboratory Control Sample (LCS) |
| 1203181457 | 358008002(CAWR-14-86933) Sample Duplicate (DUP) |
| 1203181458 | 358008002(CAWR-14-86933) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in

March 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203181456 (MB) and 1203181459 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 358008002 (CAWR-14-86933). The QC was from ARSL work order 358008.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike, 1203181458 (CAWR-14-86933), aliquot was reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **WSP-GrossA/B** |
| Analytical Method: | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1425562 |

| Sample ID | Client ID |
|---|---|
| 357745003 | CAWR-14-86942 |
| 1203183244 | MB for batch 1425562 |
| 1203183248 | Laboratory Control Sample (LCS) |
| 1203183245 | 358000003(CAWR-14-86932) Sample Duplicate (DUP) |
| 1203183246 | 358000003(CAWR-14-86932) Matrix Spike (MS) |
| 1203183247 | 358000003(CAWR-14-86932) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203183244 (MB) and 1203183248 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 358000003 (CAWR-14-86932). The QC was from ARSL work order 358000.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Gross Alpha/Beta Preparation Information**
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

**Recounts**
Sample 1203183248 (LCS) was recounted due to high recovery. The recount is reported. Sample 1203183245 (CAWR-14-86932) was recounted due to high MDC. The recount is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike and matrix spike duplicate, 1203183246 (CAWR-14-86932) and 1203183247 (CAWR-14-86932), aliquots were reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2014-4642  GEL Work Order: 357745

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Theresa L. Austin  **Name: Theresa Austin**

**Date: 28 OCT 2014**  **Title: Group Leader**

# Sample Data Summary

# GEL LABORATORIES LLC

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# Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545 Report Date: October 28, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86942
Sample ID: 357745003
Matrix: W
Collect Date: 29-SEP-14
Receive Date: 01-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.00 | +/-0.00666 | 0.0527 | 0.0211 | +/-0.00666 | 0.050 | pCi/L | | JXR1 | 10/22/14 | 1414 | 1427568 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00 | +/-0.00395 | 0.0415 | 0.017 | +/-0.00395 | 0.050 | pCi/L | | JXR1 | 10/07/14 | 1229 | 1423583 | 2 |
| Plutonium-239/240 | U | -0.00279 | +/-0.0128 | 0.0366 | 0.0145 | +/-0.0128 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 1.42 | +/-0.0621 | 0.0675 | 0.0301 | +/-0.111 | 1.00 | pCi/L | | JXR1 | 10/07/14 | 1229 | 1423584 | 3 |
| Uranium-235/236 | U | 0.0298 | +/-0.011 | 0.0472 | 0.0191 | +/-0.0112 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.708 | +/-0.0439 | 0.036 | 0.0143 | +/-0.0633 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | -0.765 | +/-1.38 | 4.78 | 2.19 | +/-1.39 | 8.00 | pCi/L | | MJH1 | 10/07/14 | 0616 | 1423982 | 4 |
| Cobalt-60 | U | 5.67 | +/-1.51 | 6.80 | 3.10 | +/-2.01 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | -1.26 | +/-2.36 | 8.03 | 3.77 | +/-2.38 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | 7.32 | +/-22.2 | 38.6 | 16.3 | +/-22.2 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | -1.4 | +/-1.34 | 4.51 | 1.97 | +/-1.38 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | -0.0176 | +/-0.136 | 0.480 | 0.225 | +/-0.136 | 0.500 | pCi/L | | KSD1 | 10/13/14 | 1339 | 1424874 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | U | 1.24 | +/-0.878 | 2.88 | 1.33 | +/-0.888 | 3.00 | pCi/L | | JXH3 | 10/11/14 | 1320 | 1425562 | 6 |
| Alpha | U | 2.52 | +/-0.939 | 2.87 | 1.26 | +/-0.964 | 3.00 | pCi/L | | JXH3 | 10/21/14 | 0957 | 1425562 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1427568 | 37.8 * | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1423583 | 83.1 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1423584 | 83.5 | (50%-105%) |

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: October 28, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86942
Sample ID: 357745003

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1424874 | 99.3 | (50%-105%) |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# Quality Control Data

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

**Report Date: October 28, 2014**


**Client :** **Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**

**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **357745**

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1423583 | | | | | | | | | | |
| QC1203178350 357745003 DUP | | | | | | | | | | |
| Plutonium-238 | U | 0.00 | U | 0.00271 | pCi/L | 0.157 | | (0-1) | JXR1 | 10/07/1412:29 |
| | Uncert: | +/-0.00395 | | +/-0.00469 | | | | | | |
| | TPU: | +/-0.00395 | | +/-0.0047 | | | | | | |
| Plutonium-239/240 | U | -0.00279 | U | 0.0163 | pCi/L | 0.465 | | (0-1) | | |
| | Uncert: | +/-0.0128 | | +/-0.00766 | | | | | | |
| | TPU: | +/-0.0128 | | +/-0.0077 | | | | | | |
| **Plutonium-242 Tracer | 2.46 | 2.05 | | 1.98 | pCi/L | | 80.6 | (50%-105%) | | |
| | Uncert: | +/-0.0832 | | +/-0.0818 | | | | | | |
| | TPU: | +/-0.136 | | +/-0.134 | | | | | | |
| QC1203178351 LCS | | | | | | | | | | |
| Plutonium-238 | | | U | 0.0173 | pCi/L | | | (80%-120%) | JXR1 | 10/07/1412:29 |
| | Uncert: | | | +/-0.00683 | | | | | | |
| | TPU: | | | +/-0.00687 | | | | | | |
| Plutonium-239/240 | 1.97 | | | 2.07 | pCi/L | | 105 | (80%-120%) | | |
| | Uncert: | | | +/-0.0671 | | | | | | |
| | TPU: | | | +/-0.112 | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.56 | pCi/L | | 79.2 | (50%-105%) | | |
| | Uncert: | | | +/-0.0655 | | | | | | |
| | TPU: | | | +/-0.108 | | | | | | |
| QC1203178349 MB | | | | | | | | | | |
| Plutonium-238 | | | U | -0.00417 | pCi/L | | | | JXR1 | 10/07/1412:29 |
| | Uncert: | | | +/-0.00511 | | | | | | |
| | TPU: | | | +/-0.00511 | | | | | | |
| Plutonium-239/240 | | | U | 0.00835 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00723 | | | | | | |
| | TPU: | | | +/-0.00724 | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.66 | pCi/L | | 84.5 | (50%-105%) | | |
| | Uncert: | | | +/-0.0644 | | | | | | |
| | TPU: | | | +/-0.106 | | | | | | |
| Batch 1423584 | | | | | | | | | | |
| QC1203178353 357745003 DUP | | | | | | | | | | |
| Uranium-234 | | 1.42 | | 1.30 | pCi/L | 0.282 | | (0-1) | JXR1 | 10/07/1412:29 |
| | Uncert: | +/-0.0621 | | +/-0.0682 | | | | | | |
| | TPU: | +/-0.111 | | +/-0.110 | | | | | | |
| Uranium-235/236 | U | 0.0298 | U | 0.0476 | pCi/L | 0.315 | | (0-1) | | |
| | Uncert: | +/-0.011 | | +/-0.0168 | | | | | | |
| | TPU: | +/-0.0112 | | +/-0.0171 | | | | | | |
| Uranium-238 | | 0.708 | | 0.690 | pCi/L | 0.0687 | | (0-1) | | |
| | Uncert: | +/-0.0439 | | +/-0.0496 | | | | | | |
| | TPU: | +/-0.0633 | | +/-0.0677 | | | | | | |
| **Uranium-232 Tracer | 2.74 | 2.28 | | 1.75 | pCi/L | | 63.9 | (50%-105%) | | |

## QC Summary

**Workorder: 357745**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1423584 | | | | | | | | | | |
| Uncert: | | +/-0.086 | | +/-0.098 | | | | | | |
| TPU: | | +/-0.196 | | +/-0.207 | | | | | | |
| QC1203178354 LCS | | | | | | | | | | |
| Uranium-234 | | | | 2.66 | pCi/L | | | | JXR1 | 10/07/1412:30 |
| Uncert: | | | | +/-0.0782 | | | | | | |
| TPU: | | | | +/-0.190 | | | | | | |
| Uranium-235/236 | | | | 0.172 | pCi/L | | | | | |
| Uncert: | | | | +/-0.0224 | | | | | | |
| TPU: | | | | +/-0.025 | | | | | | |
| Uranium-238 | 2.72 | | | 2.87 | pCi/L | | 106 | (80%-120%) | | |
| Uncert: | | | | +/-0.0811 | | | | | | |
| TPU: | | | | +/-0.203 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.89 | pCi/L | | 86.4 | (50%-105%) | | |
| Uncert: | | | | +/-0.0711 | | | | | | |
| TPU: | | | | +/-0.159 | | | | | | |
| QC1203178352 MB | | | | | | | | | | |
| Uranium-234 | | | U | 0.00691 | pCi/L | | | | JXR1 | 10/07/1412:29 |
| Uncert: | | | | +/-0.00764 | | | | | | |
| TPU: | | | | +/-0.00765 | | | | | | |
| Uranium-235/236 | | | U | 0.00 | pCi/L | | | | | |
| Uncert: | | | | +/-0.00569 | | | | | | |
| TPU: | | | | +/-0.0057 | | | | | | |
| Uranium-238 | | | U | 0.00691 | pCi/L | | | | | |
| Uncert: | | | | +/-0.00609 | | | | | | |
| TPU: | | | | +/-0.00611 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.60 | pCi/L | | 73 | (50%-105%) | | |
| Uncert: | | | | +/-0.0717 | | | | | | |
| TPU: | | | | +/-0.159 | | | | | | |
| Batch 1427568 | | | | | | | | | | |
| QC1203188104 357745003 DUP | | | | | | | | | | |
| Americium-241 | U | 0.00 | U | 0.00748 | pCi/L | 0.204 | | (0-1) | JXR1 | 10/22/1414:14 |
| Uncert: | | +/-0.00666 | | +/-0.0117 | | | | | | |
| TPU: | | +/-0.00666 | | +/-0.0117 | | | | | | |
| **Americium-243 Tracer | 2.67 | 1.01 | | 0.998 | pCi/L | | 37.3 * | (50%-105%) | | |
| Uncert: | | +/-0.101 | | +/-0.0963 | | | | | | |
| TPU: | | +/-0.163 | | +/-0.157 | | | | | | |
| QC1203188105 LCS | | | | | | | | | | |
| Americium-241 | 1.41 | | | 1.46 | pCi/L | | 103 | (80%-120%) | JXR1 | 10/21/1413:37 |
| Uncert: | | | | +/-0.0734 | | | | | | |
| TPU: | | | | +/-0.104 | | | | | | |
| **Americium-243 Tracer | 2.14 | | | 1.10 | pCi/L | | 51.5 | (50%-105%) | | |
| Uncert: | | | | +/-0.0884 | | | | | | |
| TPU: | | | | +/-0.140 | | | | | | |
| QC1203188103 MB | | | | | | | | | | |
| Americium-241 | | | U | 0.000543 | pCi/L | | | | JXR1 | 10/22/1414:14 |
| Uncert: | | | | +/-0.013 | | | | | | |

## QC Summary

**Workorder:** **357745**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1427568 | | | | | | | | | | |
| | TPU: | | | +/-0.013 | | | | | | |
| **Americium-243 Tracer | 2.14 | | | 0.900 | pCi/L | | 42.1 * | (50%-105%) | | |
| | Uncert: | | | +/-0.0741 | | | | | | |
| | TPU: | | | +/-0.122 | | | | | | |
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1423982 | | | | | | | | | | |
| QC1203179288 357745003 DUP | | | | | | | | | | |
| Cesium-137 | U | -0.765 | U | -2.35 | pCi/L | 0.296 | | (0-1) | MJH1 | 10/07/1411:20 |
| | Uncert: | +/-1.38 | | +/-1.16 | | | | | | |
| | TPU: | +/-1.39 | | +/-1.28 | | | | | | |
| Cobalt-60 | U | 5.67 | U | 0.133 | pCi/L | 0.852 | | (0-1) | | |
| | Uncert: | +/-1.51 | | +/-1.24 | | | | | | |
| | TPU: | +/-2.01 | | +/-1.24 | | | | | | |
| Neptunium-237 | U | -1.26 | U | 2.11 | pCi/L | 0.338 | | (0-1) | | |
| | Uncert: | +/-2.36 | | +/-2.55 | | | | | | |
| | TPU: | +/-2.38 | | +/-2.60 | | | | | | |
| Potassium-40 | U | 7.32 | U | 0.515 | pCi/L | 0.0895 | | (0-1) | | |
| | Uncert: | +/-22.2 | | +/-15.8 | | | | | | |
| | TPU: | +/-22.2 | | +/-15.8 | | | | | | |
| Sodium-22 | U | -1.4 | U | 1.15 | pCi/L | 0.512 | | (0-1) | | |
| | Uncert: | +/-1.34 | | +/-1.07 | | | | | | |
| | TPU: | +/-1.38 | | +/-1.11 | | | | | | |
| QC1203179289 LCS | | | | | | | | | | |
| Americium-241 | 34500 | | | 34300 | pCi/L | | 99.5 | (80%-120%) | MJH1 | 10/07/1411:19 |
| | Uncert: | | | +/-395 | | | | | | |
| | TPU: | | | +/-2300 | | | | | | |
| Cesium-137 | 14000 | | | 14300 | pCi/L | | 102 | (80%-120%) | | |
| | Uncert: | | | +/-202 | | | | | | |
| | TPU: | | | +/-613 | | | | | | |
| Cobalt-60 | 16900 | | | 17100 | pCi/L | | 101 | (80%-120%) | | |
| | Uncert: | | | +/-238 | | | | | | |
| | TPU: | | | +/-724 | | | | | | |
| Neptunium-237 | | | U | -92.2 | pCi/L | | | | | |
| | Uncert: | | | +/-93.6 | | | | | | |
| | TPU: | | | +/-96.1 | | | | | | |
| Potassium-40 | | | U | -274 | pCi/L | | | | | |
| | Uncert: | | | +/-274 | | | | | | |
| | TPU: | | | +/-281 | | | | | | |
| Sodium-22 | | | U | 12.8 | pCi/L | | | | | |
| | Uncert: | | | +/-32.3 | | | | | | |
| | TPU: | | | +/-32.5 | | | | | | |
| QC1203179287 MB | | | | | | | | | | |
| Cesium-137 | | | U | 1.24 | pCi/L | | | | MJH1 | 10/07/1411:19 |
| | Uncert: | | | +/-1.48 | | | | | | |
| | TPU: | | | +/-1.50 | | | | | | |
| Cobalt-60 | | | U | -2.89 | pCi/L | | | | | |

## QC Summary

**Workorder: 357745**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1423982 | | | | | | | | | | |
| | Uncert: | | | +/-1.50 | | | | | | |
| | TPU: | | | +/-1.64 | | | | | | |
| Neptunium-237 | | | U | 1.48 | pCi/L | | | | | |
| | Uncert: | | | +/-2.39 | | | | | | |
| | TPU: | | | +/-2.41 | | | | | | |
| Potassium-40 | | | U | -6.49 | pCi/L | | | | | |
| | Uncert: | | | +/-18.6 | | | | | | |
| | TPU: | | | +/-18.7 | | | | | | |
| Sodium-22 | | | U | -0.0019 | pCi/L | | | | | |
| | Uncert: | | | +/-1.48 | | | | | | |
| | TPU: | | | +/-1.48 | | | | | | |
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1424874 | | | | | | | | | | |
| QC1203181457 358008002 DUP | | | | | | | | | | |
| Strontium-90 | U | -0.0355 | U | -0.213 | pCi/L | 0.337 | | (0-1) | KSD1 | 10/13/1413:34 |
| | Uncert: | +/-0.134 | | +/-0.130 | | | | | | |
| | TPU: | +/-0.134 | | +/-0.130 | | | | | | |
| **Strontium Carrier | 7.65 | 6.40 | | 6.90 | mg | | 90.2 | (50%-105%) | | |
| QC1203181459 LCS | | | | | | | | | | |
| Strontium-90 | 22.4 | | | 21.6 | pCi/L | | 96.3 | (80%-120%) | KSD1 | 10/13/1413:34 |
| | Uncert: | | | +/-0.649 | | | | | | |
| | TPU: | | | +/-1.85 | | | | | | |
| **Strontium Carrier | 7.65 | | | 8.00 | mg | | 105 | (50%-105%) | | |
| QC1203181456 MB | | | | | | | | | | |
| Strontium-90 | | | U | 0.00704 | pCi/L | | | | KSD1 | 10/13/1413:36 |
| | Uncert: | | | +/-0.135 | | | | | | |
| | TPU: | | | +/-0.135 | | | | | | |
| **Strontium Carrier | 7.65 | | | 7.20 | mg | | 94.1 | (50%-105%) | | |
| QC1203181458 358008002 MS | | | | | | | | | | |
| Strontium-90 | 225 U | -0.0355 | | 269 | pCi/L | | 120 | (75%-125%) | KSD1 | 10/13/1413:34 |
| | Uncert: | +/-0.134 | | +/-8.11 | | | | | | |
| | TPU: | +/-0.134 | | +/-23.0 | | | | | | |
| **Strontium Carrier | 7.65 | 6.40 | | 6.40 | mg | | 83.7 | (50%-105%) | | |
| Batch 1425562 | | | | | | | | | | |
| QC1203183245 358000003 DUP | | | | | | | | | | |
| Alpha | U | 1.73 | U | -0.733 | pCi/L | 0.857 | | (0-1) | JXH3 | 10/24/1412:34 |
| | Uncert: | +/-0.893 | | +/-0.530 | | | | | | |
| | TPU: | +/-0.905 | | +/-0.531 | | | | | | |
| Beta | U | 1.38 | U | 2.22 | pCi/L | 0.223 | | (0-1) | | 10/11/1413:21 |
| | Uncert: | +/-0.879 | | +/-0.957 | | | | | | |
| | TPU: | +/-0.889 | | +/-0.978 | | | | | | |
| QC1203183248 LCS | | | | | | | | | | |
| Alpha | 12.2 | | | 12.9 | pCi/L | | 106 | (80%-120%) | JXH3 | 10/21/1410:39 |
| | Uncert: | | | +/-0.628 | | | | | | |
| | TPU: | | | +/-1.24 | | | | | | |

## QC Summary

**Workorder:** **357745**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1425562 | | | | | | | | | | |
| Beta | 47.8 | | | 54.7 | pCi/L | | 114 | (80%-120%) | | |
| | Uncert: | | | +/-0.954 | | | | | | |
| | TPU: | | | +/-4.68 | | | | | | |
| QC1203183244 MB | | | | | | | | | | |
| Alpha | | | U | -0.179 | pCi/L | | | | JXH3 | 10/21/1410:37 |
| | Uncert: | | | +/-0.0524 | | | | | | |
| | TPU: | | | +/-0.0525 | | | | | | |
| Beta | | | U | -0.0708 | pCi/L | | | | | 10/11/1413:18 |
| | Uncert: | | | +/-0.162 | | | | | | |
| | TPU: | | | +/-0.162 | | | | | | |
| QC1203183246 358000003 MS | | | | | | | | | | |
| Alpha | 405 | U | 1.73 | 364 | pCi/L | | 89.8 | (75%-125%) | JXH3 | 10/21/1410:37 |
| | Uncert: | | +/-0.893 | +/-21.6 | | | | | | |
| | TPU: | | +/-0.905 | +/-37.6 | | | | | | |
| Beta | 1590 | U | 1.38 | 1410 | pCi/L | | 88.7 | (75%-125%) | | 10/11/1413:16 |
| | Uncert: | | +/-0.879 | +/-28.7 | | | | | | |
| | TPU: | | +/-0.889 | +/-121 | | | | | | |
| QC1203183247 358000003 MSD | | | | | | | | | | |
| Alpha | 405 | U | 1.73 | 329 | pCi/L | 0.241 | 81.3 | (0-1) | JXH3 | 10/21/1410:37 |
| | Uncert: | | +/-0.893 | +/-19.5 | | | | | | |
| | TPU: | | +/-0.905 | +/-34.2 | | | | | | |
| Beta | 1590 | U | 1.38 | 1880 | pCi/L | 0.825 | 118 | (0-1) | | 10/11/1414:50 |
| | Uncert: | | +/-0.879 | +/-32.6 | | | | | | |
| | TPU: | | +/-0.889 | +/-159 | | | | | | |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

| | |
|---|---|
| ** | Analyte is a Tracer compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| BD | Results are either below the MDC or tracer recovery is low |
| FA | Failed analysis. |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| K | Analyte present. Reported value may be biased high. Actual value is expected to be lower. |
| L | Analyte present. Reported value may be biased low. Actual value is expected to be higher. |
| M | M if above MDC and less than LLD |
| M | REMP Result > MDC/CL and < RDL |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |

## QC Summary

**Workorder:** **357745**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| UI | Gamma Spectroscopy--Uncertain identification |
| UJ | Gamma Spectroscopy--Uncertain identification |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | Other specific qualifiers were required to properly define the results. Consult case narrative. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
** Indicates analyte is a surrogate/tracer compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Shealy Labs
106 Vantage Point Drive
West Columbia SC 19172
803-227-3150

# Chain of Custody/Analysis Request

COC/Lab Request #: 2014-4644



Client Contact:

Lab Agreement # :
Project Number :
Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-8260B | WSP-LL-8260B-TB | WSP-LL-8270C |
|---|---|---|---|---|---|---|
| CAWR-14-86942 | Sep 29 2014 | 10:21 | W | 2 | | |
| CAWR-14-86969 | Sep 29 2014 | 10:21 | W | | | |
| CAWR-14-86892 | Sep 29 2014 | 10:21 | W | | | 1 |
| CAWR-14-86915 | Sep 29 2014 | 10:21 | W | | 1 | |
| CAWR-14-86943 | Sep 29 2014 | 12:20 | W | | | 1 |
| CAWR-14-86916 | Sep 29 2014 | 12:20 | W | | 1 | |
| CAWR-14-87098 | Sep 29 2014 | 12:20 | W | 2 | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | K. Greene | 9/30/14 15:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86892

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1021 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Spring 1 | | FIELD PREP: | UF | OK |
| LOCATION TYPE: | SUP | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | Y | NA |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 6.18 mg/L  Flow (in gpm) 3.14 GPM  Oxidation-Reduction Potential 183.3 mV

pH 7.28 SU  Specific Conductance 216 uS/cm  Temperature 18.94 deg C

Turbidity 3.5 NTU

**COLLECTED BY (PRINT)** S. Turmack, K. Reid

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Valdez<br>(Signature) | 9/29/14 1620 | (Printed Name) S. Sherwood<br>(Signature) | 9/29/14 1620 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86915 **WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: WG | | QC |
| TIME COLLECTED (HH:MM): | | 1021 | MEDIA: UA | | |
| PRS ID: | | OK | SAMPLE TECH CODE: UA | | WS 9/29/14 PP DC |
| LOCATION ID: Spring 1 | | | FIELD PREP: UF | | QC |
| LOCATION TYPE: | | | FIELD QC TYPE: FTB | | |
| PORT: | | | SAMPLE USAGE: QC | | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS WS 9/29/14 | 2 | HCL | | |
| | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ WS 9/29/14 HCL | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:** WS 9/29/14

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** S Aumack, K Reid

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Vigil (Signature) | 9/29/14 1620 | (Printed Name) S. Sherwood (Signature) | 9/29/14 1620 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86916

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1620 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: Spring 2 | | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | FTB | |
| PORT: | | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | N/A |
| N/A | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ HCL | Y | N/A |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:** WS 9/29/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** S Armack

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Ulgin<br>(Signature) | 9/29/14 1620 | (Printed Name) S Sherwood<br>(Signature) | 9/29/14 1620 |
| **RELINQUISHED BY** | **Date/Time** | **RECEIVED BY** | **Date/Time** |
| (Printed Name)<br>(Signature) | | (Printed Name)<br>(Signature) | |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86942 **WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1021 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Spring 1 | | | FIELD PREP: | UF | OK |
| LOCATION TYPE: SPR | | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | 3 | ICE 10/9/14 | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

| | | | |
|---|---|---|---|
| **EVENT ID:** | 6888 | **EVENT NAME:** | White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event |
| **SAMPLE ID:** | CAWR-14-86942 | **WORK ORDER:** | NA |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 6.18 mg/L Flow (in gpm) 3.14 GPM Oxidation-Reduction Potential 183.3 mV

pH 7.78 SU Specific Conductance 216 uS/cm Temperature 18.94 deg C

Turbidity 3.5 NTU

**COLLECTED BY (PRINT)** S. Acmack, K. Reid

| | | | |
|---|---|---|---|
| **RELINQUISHED BY**<br>**(Printed Name)** ANDREW VIGIL<br>**(Signature)** | **Date/Time**<br>9/29/14<br>1620 | **RECEIVED BY**<br>**(Printed Name)** S. Sherwood<br>**(Signature)** | **Date/Time**<br>9/29/14<br>1620 |
| **RELINQUISHED BY**<br>**(Printed Name)**<br>**(Signature)** | **Date/Time** | **RECEIVED BY**<br>**(Printed Name)**<br>**(Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86943

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1220 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Spring 2 | | FIELD PREP: | UF | OK |
| LOCATION TYPE: | SPR | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| N/A | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | Y | N/A |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** J-Armad

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Vigil<br>(Signature) | 9/29/14 1620 | (Printed Name) S-Sherwood<br>(Signature) | 9/29/14 1620 |
| **RELINQUISHED BY** | **Date/Time** | **RECEIVED BY** | **Date/Time** |
| (Printed Name)<br>(Signature) | | (Printed Name)<br>(Signature) | |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-87098

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 0620 | MEDIA: | UA | ✓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Spring 2 | ✓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | SPR | ✓ | FIELD QC TYPE: | REG | ✓ |
| PORT: | | ✓ | SAMPLE USAGE: | | ✓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | Y | N/A |
| N/A | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | N/A |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 6.32 mg/L  Flow (in gpm) 0.7gpm GPM  Oxidation-Reduction Potential N/A mV

pH 7.96 SU  Specific Conductance 192 uS/cm  Temperature 17.76 deg C

Turbidity 13.4 NTU

**COLLECTED BY (PRINT)** S. Armack

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Vigil<br>(Signature) | 9/29/14 1620 | (Printed Name) S. Sherwood<br>(Signature) S. Sherwood | 9/29/14 1620 |
| **RELINQUISHED BY**<br>**(Printed Name)**<br>**(Signature)** | **Date/Time** | **RECEIVED BY**<br>**(Printed Name)**<br>**(Signature)** | **Date/Time** |

Report Date 09/16/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2014-4644 – 4646

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| PJ01050 | SW-846:8260B | 2 | | 2 | | |
| PJ01050 | SW-846:8270D | 7 | 1 | | 1 | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PJ01050 | SW-846:8260B | 57809 | NA | 1 | | 2 | | | 1 | | | | | 1 | 1 | | | | | | |
| PJ01050 | SW-846:8260B | 57853 | NA | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |
| PJ01050 | SW-846:8270D | 57593 | 57502 | 7 | 1 | | 1 | | 1 | | | | | 1 | | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8260B | VOC | null | PQ57809-001 | MB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | null | PQ57809-002 | LCS | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | null | PQ57809-003 | LCSD | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | null | PQ57853-001 | MB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | null | PQ57853-002 | LCS | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | null | PQ57853-003 | LCSD | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | CAWR-14-86915 | PJ01050-010 | FTB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86916 | PJ01050-012 | FTB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86942 | PJ01050-008 | REG | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-87098 | PJ01050-013 | REG | 5 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | null | PQ57502-001 | MB | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | null | PQ57502-002 | LCS | 0 | 6 | 10 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86879 | PJ01050-006 | FB | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86883 | PJ01050-002 | FD | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86890 | PJ01050-001 | REG | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86892 | PJ01050-009 | REG | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86894 | PJ01050-003 | REG | 13 | 6 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8270D | SVOC | CAWR-14-86895 | PJ01050-004 | REG | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86896 | PJ01050-005 | REG | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86897 | PJ01050-007 | REG | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86943 | PJ01050-011 | REG | 13 | 6 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

# DATA VALIDATION REPORT

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

| Reason Code | Description |
|---|---|
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86879 | Spring 4 | FB | SW-846:8270D | 0 | 13 |
| CAWR-14-86883 | Spring 3 | FD | SW-846:8270D | 0 | 13 |
| CAWR-14-86890 | Pajarito at Rio Grande | REG | SW-846:8270D | 0 | 13 |
| CAWR-14-86892 | Spring 1 | REG | SW-846:8270D | 0 | 13 |
| CAWR-14-86894 | Spring 3 | REG | SW-846:8270D | 0 | 13 |
| CAWR-14-86895 | Spring 3A | REG | SW-846:8270D | 0 | 13 |
| CAWR-14-86896 | Spring 3AA | REG | SW-846:8270D | 0 | 13 |
| CAWR-14-86897 | Spring 4 | REG | SW-846:8270D | 0 | 13 |
| CAWR-14-86915 | Spring 1 | FTB | SW-846:8260B | 0 | 5 |
| CAWR-14-86916 | Spring 2 | FTB | SW-846:8260B | 0 | 5 |
| CAWR-14-86942 | Spring 1 | REG | SW-846:8260B | 0 | 5 |
| CAWR-14-86943 | Spring 2 | REG | SW-846:8270D | 0 | 13 |
| CAWR-14-87098 | Spring 2 | REG | SW-846:8260B | 0 | 5 |

# SHEALY ENVIRONMENTAL SERVICES, INC.

## Report of Analysis

**Los Alamos National Lab**
TA-3 SM-271 Drop Point O2U
Los Alamos, NM 87545
Attention: Keith Greene

Lot Number:**PJ01050**
Date Completed:**10/13/2014**

**Grant Wilton**
Project Manager

This report shall not be reproduced, except in its entirety, without the written approval of Shealy Environmental Services, Inc.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

* P J 0 1 0 5 0 *

## Case Narrative
## Los Alamos National Lab
### Lot Number: PJ01050

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Receiving
Sample receipt temperature - 9.5 Degrees C.

# SHEALY ENVIRONMENTAL SERVICES, INC.

## Sample Summary
## Los Alamos National Lab
### Lot Number: PJ01050

| Sample Number | Sample ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| 001 | CAWR-14-86890 | Aqueous | 09/29/2014 1612 | 10/01/2014 |
| 002 | CAWR-14-86883 | Aqueous | 09/29/2014 1130 | 10/01/2014 |
| 003 | CAWR-14-86894 | Aqueous | 09/29/2014 1130 | 10/01/2014 |
| 004 | CAWR-14-86895 | Aqueous | 09/29/2014 1205 | 10/01/2014 |
| 005 | CAWR-14-86896 | Aqueous | 09/29/2014 1540 | 10/01/2014 |
| 006 | CAWR-14-86879 | Aqueous | 09/29/2014 1535 | 10/01/2014 |
| 007 | CAWR-14-86897 | Aqueous | 09/29/2014 1535 | 10/01/2014 |
| 008 | CAWR-14-86942 | Aqueous | 09/29/2014 1021 | 10/01/2014 |
| 009 | CAWR-14-86892 | Aqueous | 09/29/2014 1021 | 10/01/2014 |
| 010 | CAWR-14-86915 | Aqueous | 09/29/2014 1021 | 10/01/2014 |
| 011 | CAWR-14-86943 | Aqueous | 09/29/2014 1220 | 10/01/2014 |
| 012 | CAWR-14-86916 | Aqueous | 09/29/2014 1220 | 10/01/2014 |
| 013 | CAWR-14-87098 | Aqueous | 09/29/2014 1220 | 10/01/2014 |

(13 samples)

# SHEALY ENVIRONMENTAL SERVICES, INC.

## Executive Summary

## Los Alamos National Lab

### Lot Number: PJ01050

| Sample | Sample ID | Matrix | Parameter | Method | Result | Q | Units | Page |
|---|---|---|---|---|---|---|---|---|

(0 detections)

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-001**
Description: **CAWR-14-86890**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1612**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1419 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.4 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 27 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.4 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.4 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 27 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 27 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.4 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.4 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 91 | 41-144 |
| 2-Fluorobiphenyl | | 98 | 37-129 |
| 2-Fluorophenol | | 68 | 24-127 |
| Nitrobenzene-d5 | | 92 | 38-127 |
| Phenol-d5 | | 81 | 28-128 |
| Terphenyl-d14 | | 96 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-002**
Description: **CAWR-14-86883**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1130**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1445 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 26 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.3 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 26 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 26 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.3 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 96 | 41-144 |
| 2-Fluorobiphenyl | | 97 | 37-129 |
| 2-Fluorophenol | | 68 | 24-127 |
| Nitrobenzene-d5 | | 91 | 38-127 |
| Phenol-d5 | | 81 | 28-128 |
| Terphenyl-d14 | | 101 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-003**
Description: **CAWR-14-86894**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1130**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1512 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 26 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.3 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 26 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 26 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.3 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 91 | 41-144 |
| 2-Fluorobiphenyl | | 100 | 37-129 |
| 2-Fluorophenol | | 70 | 24-127 |
| Nitrobenzene-d5 | | 94 | 38-127 |
| Phenol-d5 | | 82 | 28-128 |
| Terphenyl-d14 | | 103 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-004**
Description: **CAWR-14-86895**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1205**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1538 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.1 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 26 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.1 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.1 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 26 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 26 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.1 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.1 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.1 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.1 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.1 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.1 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.1 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 91 | 41-144 |
| 2-Fluorobiphenyl | | 95 | 37-129 |
| 2-Fluorophenol | | 66 | 24-127 |
| Nitrobenzene-d5 | | 89 | 38-127 |
| Phenol-d5 | | 76 | 28-128 |
| Terphenyl-d14 | | 99 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-005**
Description: **CAWR-14-86896**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1540**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1605 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.4 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 27 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.4 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.4 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 27 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 27 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.4 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.4 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.4 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 90 | 41-144 |
| 2-Fluorobiphenyl | | 94 | 37-129 |
| 2-Fluorophenol | | 68 | 24-127 |
| Nitrobenzene-d5 | | 91 | 38-127 |
| Phenol-d5 | | 80 | 28-128 |
| Terphenyl-d14 | | 98 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-006**
Description: **CAWR-14-86879**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1535**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1632 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 27 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.3 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 27 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 27 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.3 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 83 | 41-144 |
| 2-Fluorobiphenyl | | 98 | 37-129 |
| 2-Fluorophenol | | 71 | 24-127 |
| Nitrobenzene-d5 | | 93 | 38-127 |
| Phenol-d5 | | 83 | 28-128 |
| Terphenyl-d14 | | 100 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-007**
Description: **CAWR-14-86897**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1535**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1658 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.0 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 25 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.0 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.0 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 25 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 25 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.0 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 80 | 41-144 |
| 2-Fluorobiphenyl | | 83 | 37-129 |
| 2-Fluorophenol | | 59 | 24-127 |
| Nitrobenzene-d5 | | 81 | 38-127 |
| Phenol-d5 | | 67 | 28-128 |
| Terphenyl-d14 | | 70 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-008**
Description: **CAWR-14-86942**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1021**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/09/2014 0449 | PMM2 | | 57853 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 84 | 70-130 |
| Bromofluorobenzene | | 86 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-009**
Description: **CAWR-14-86892**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1021**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1725 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 26 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.3 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 26 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 26 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.3 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 84 | 41-144 |
| 2-Fluorobiphenyl | | 93 | 37-129 |
| 2-Fluorophenol | | 68 | 24-127 |
| Nitrobenzene-d5 | | 91 | 38-127 |
| Phenol-d5 | | 79 | 28-128 |
| Terphenyl-d14 | | 95 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-010**
Description: **CAWR-14-86915**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1021**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/08/2014 1447 | EH1 | | 57809 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 83 | 70-130 |
| Bromofluorobenzene | | 87 | 70-130 |
| Toluene-d8 | | 92 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-011**
Description: **CAWR-14-86943**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1220**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/07/2014 1752 | RBH | 10/03/2014 1851 | 57502 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 26 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.3 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 26 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 26 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.3 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 88 | 41-144 |
| 2-Fluorobiphenyl | | 92 | 37-129 |
| 2-Fluorophenol | | 64 | 24-127 |
| Nitrobenzene-d5 | | 87 | 38-127 |
| Phenol-d5 | | 77 | 28-128 |
| Terphenyl-d14 | | 92 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-012**
Description: **CAWR-14-86916**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1220**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/08/2014 1510 | EH1 | | 57809 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 86 | 70-130 |
| Bromofluorobenzene | | 89 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: **Los Alamos National Lab**
Laboratory ID: **PJ01050-013**
Description: **CAWR-14-87098**
Matrix: **Aqueous**
Date Sampled: **09/29/2014 1220**
Date Received: **10/01/2014**

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/08/2014 1533 | EH1 | | 57809 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 85 | 70-130 |
| Bromofluorobenzene | | 88 | 70-130 |
| Toluene-d8 | | 93 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# QC Summary

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** PQ57809-001
**Batch:** 57809
**Analytical Method:** 8260B

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| Acrolein | ND | | 1 | 50 | ug/L | 10/08/2014 1401 |
| Acrylonitrile | ND | | 1 | 50 | ug/L | 10/08/2014 1401 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | ND | | 1 | 5.0 | ug/L | 10/08/2014 1401 |
| Methacrylonitrile | ND | | 1 | 5.0 | ug/L | 10/08/2014 1401 |
| 1,2,3-Trichloropropane | ND | | 1 | 5.0 | ug/L | 10/08/2014 1401 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 88 | 70-130 |
| 1,2-Dichloroethane-d4 | | 85 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** PQ57809-002
**Batch:** 57809
**Analytical Method:** 8260B

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 550 | | 1 | 111 | 60-140 | 10/08/2014 1124 |
| Acrylonitrile | 100 | 89 | | 1 | 89 | 70-130 | 10/08/2014 1124 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 49 | | 1 | 98 | 70-130 | 10/08/2014 1124 |
| Methacrylonitrile | 50 | 45 | | 1 | 90 | 70-130 | 10/08/2014 1124 |
| 1,2,3-Trichloropropane | 50 | 45 | | 1 | 90 | 70-130 | 10/08/2014 1124 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 87 | 70-130 |
| 1,2-Dichloroethane-d4 | | 82 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - LCSD

**Sample ID:** PQ57809-003
**Batch:** 57809
**Analytical Method:** 8260B

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | % Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 640 | | 1 | 128 | 14 | 60-140 | 20 | 10/08/2014 1146 |
| Acrylonitrile | 100 | 110 | | 1 | 108 | 20 | 70-130 | 20 | 10/08/2014 1146 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 50 | | 1 | 99 | 1.3 | 70-130 | 20 | 10/08/2014 1146 |
| Methacrylonitrile | 50 | 49 | | 1 | 98 | 8.7 | 70-130 | 20 | 10/08/2014 1146 |
| 1,2,3-Trichloropropane | 50 | 46 | | 1 | 92 | 2.6 | 70-130 | 20 | 10/08/2014 1146 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 88 | 70-130 |
| 1,2-Dichloroethane-d4 | | 83 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** PQ57853-001
**Batch:** 57853
**Analytical Method:** 8260B

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| Acrolein | ND | | 1 | 50 | ug/L | 10/09/2014 0059 |
| Acrylonitrile | ND | | 1 | 50 | ug/L | 10/09/2014 0059 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | ND | | 1 | 5.0 | ug/L | 10/09/2014 0059 |
| Methacrylonitrile | ND | | 1 | 5.0 | ug/L | 10/09/2014 0059 |
| 1,2,3-Trichloropropane | ND | | 1 | 5.0 | ug/L | 10/09/2014 0059 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 87 | 70-130 |
| 1,2-Dichloroethane-d4 | | 85 | 70-130 |
| Toluene-d8 | | 96 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** PQ57853-002
**Batch:** 57853
**Analytical Method:** 8260B

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 530 | | 1 | 105 | 60-140 | 10/08/2014 2328 |
| Acrylonitrile | 100 | 90 | | 1 | 90 | 70-130 | 10/08/2014 2328 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 48 | | 1 | 96 | 70-130 | 10/08/2014 2328 |
| Methacrylonitrile | 50 | 43 | | 1 | 85 | 70-130 | 10/08/2014 2328 |
| 1,2,3-Trichloropropane | 50 | 43 | | 1 | 86 | 70-130 | 10/08/2014 2328 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 87 | 70-130 |
| 1,2-Dichloroethane-d4 | | 81 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - LCSD

**Sample ID:** PQ57853-003
**Batch:** 57853
**Analytical Method:** 8260B

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | % Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 520 | | 1 | 104 | 0.92 | 60-140 | 20 | 10/08/2014 2350 |
| Acrylonitrile | 100 | 90 | | 1 | 90 | 0.089 | 70-130 | 20 | 10/08/2014 2350 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 47 | | 1 | 94 | 1.4 | 70-130 | 20 | 10/08/2014 2350 |
| Methacrylonitrile | 50 | 44 | | 1 | 89 | 3.9 | 70-130 | 20 | 10/08/2014 2350 |
| 1,2,3-Trichloropropane | 50 | 44 | | 1 | 87 | 1.3 | 70-130 | 20 | 10/08/2014 2350 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 89 | 70-130 |
| 1,2-Dichloroethane-d4 | | 83 | 70-130 |
| Toluene-d8 | | 96 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Semivolatile Organic Compounds by GC/MS - MB

**Sample ID:** PQ57502-001
**Batch:** 57502
**Analytical Method:** 8270D

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2014 1851

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| 1,2-Diphenylhydrazine(as azobenzene) | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| 3,3'-Dichlorobenzidine | ND | | 1 | 25 | ug/L | 10/07/2014 1326 |
| 4,6-Dinitro-2-methylphenol | ND | | 1 | 25 | ug/L | 10/07/2014 1326 |
| Atrazine | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| Benzidine | ND | | 1 | 25 | ug/L | 10/07/2014 1326 |
| bis(2-Chloroethyl)ether | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| bis(2-Chloroisopropyl)ether | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| Hexachlorobenzene | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| N-Nitroso-di-butylamine | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| N-Nitrosodi-n-propylamine | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| N-Nitrosodiethylamine | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| N-Nitrosodimethylamine | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |
| N-Nitrosopyrrolidine | ND | | 1 | 5.0 | ug/L | 10/07/2014 1326 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 86 | 41-144 |
| 2-Fluorobiphenyl | | 99 | 37-129 |
| 2-Fluorophenol | | 73 | 24-127 |
| Nitrobenzene-d5 | | 95 | 38-127 |
| Phenol-d5 | | 87 | 28-128 |
| Terphenyl-d14 | | 102 | 10-148 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Semivolatile Organic Compounds by GC/MS - LCS

**Sample ID:** PQ57502-002
**Batch:** 57502
**Analytical Method:** 8270D

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2014 1851

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,2-Diphenylhydrazine(as azobenzene) | 100 | 91 | | 1 | 91 | 51-116 | 10/07/2014 1352 |
| 3,3'-Dichlorobenzidine | 200 | 170 | | 1 | 86 | 53-118 | 10/07/2014 1352 |
| 4,6-Dinitro-2-methylphenol | 500 | 520 | | 1 | 105 | 46-134 | 10/07/2014 1352 |
| Atrazine | 100 | 76 | | 1 | 76 | 70-130 | 10/07/2014 1352 |
| Benzidine | 200 | 88 | | 1 | 44 | 10-115 | 10/07/2014 1352 |
| bis(2-Chloroethyl)ether | 100 | 80 | | 1 | 80 | 35-114 | 10/07/2014 1352 |
| bis(2-Chloroisopropyl)ether | 100 | 71 | | 1 | 71 | 34-110 | 10/07/2014 1352 |
| Hexachlorobenzene | 100 | 100 | | 1 | 103 | 49-128 | 10/07/2014 1352 |
| N-Nitrosodi-n-propylamine | 100 | 94 | | 1 | 94 | 39-119 | 10/07/2014 1352 |
| N-Nitrosodimethylamine | 100 | 83 | | 1 | 83 | 36-118 | 10/07/2014 1352 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 113 | 41-144 |
| 2-Fluorobiphenyl | | 101 | 37-129 |
| 2-Fluorophenol | | 76 | 24-127 |
| Nitrobenzene-d5 | | 97 | 38-127 |
| Phenol-d5 | | 86 | 28-128 |
| Terphenyl-d14 | | 106 | 10-148 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Shealy Labs

106 Vantage Point Drive
West Columbia SC 19172
803-227-3150

## Chain of Custody/Analysis Request

ADep

COC/Lab Request #: 2014-4646

Page 1 of 1

Client Contact:

Lab Agreement # :

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-8270C |
|---|---|---|---|---|
| CAWR-14-86890 | Sep 29 2014 | 16:12 | W | 1 |
| CAWR-14-86883 | Sep 29 2014 | 11:30 | W | 1 |
| CAWR-14-86894 | Sep 29 2014 | 11:30 | W | 1 |
| CAWR-14-86895 | Sep 29 2014 | 12:05 | W | 1 |
| CAWR-14-86896 | Sep 29 2014 | 15:40 | W | 1 |
| CAWR-14-86879 | Sep 29 2014 | 15:35 | W | 1 |
| CAWR-14-86897 | Sep 29 2014 | 15:35 | W | 1 |

PJ01050

Special Instructions:

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: | Print Name: Melissa Mark, | Date/Time: 9/30/14 3:45 | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: Fedex | Date/Time: 9-1-14/0958 | Received by: | Print Name: Kelly W Price | Date/Time: 10-1-14 0958 |

T= 9.5°

Shealy Labs
106 Vantage Point Drive
West Columbia SC 19172
803-227-3150

# Chain of Custody/Analysis Request

COC/Lab Request #: 2014-4644
Page 1 of 1

Client Contact:

Lab Agreement # :
Project Number :
Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions: PJ01050

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-8260B | WSP-LL-8260B-TB | WSP-LL-8270C |
|---|---|---|---|---|---|---|
| CAWR-14-86942 | Sep 29 2014 | 10:21 | W | 2 | | |
| CAWR-14-86969 | Sep 29 2014 | 10:21 | W | | | |
| CAWR-14-86892 | Sep 29 2014 | 10:21 | W | | | 1 |
| CAWR-14-86915 | Sep 29 2014 | 10:21 | W | | 1 | |
| CAWR-14-86943 | Sep 29 2014 | 12:20 | W | | | 1 |
| CAWR-14-86916 | Sep 29 2014 | 12:20 | W | | 1 | |
| CAWR-14-87098 | Sep 29 2014 | 12:20 | W | 2 | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | K. Greene | 9/30/14 15:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| | | | | | |
| Relinquished by: | Print Name: Fedex | Date/Time: 10-1-14 0958 | Received by: [signature] | Print Name: Kelly W Price | Date/Time: 10-1-14/0958 |

T=9.5°

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 15

Page 1 of 1
Replaces Date: 03/07/14
Effective Date: 07/15/14

# Sample Receipt Checklist (SRC)

Client: ARS Cooler Inspected by/date: KWP /10-1-14 Lot #: PJ01050

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other

| | | | |
|---|---|---|---|
| Yes ☑ | No ☐ | | 1. Were custody seals present on the cooler? |
| Yes ☑ | No ☐ | NA ☐ | 2. If custody seals were present, were they intact and unbroken? |

Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt:
19.1 / 19.5 °C / / °C / / °C / / °C
Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: #3 IR Gun Correction Factor: +0.4°C
Method of coolant: ☑ Wet Ice KWP 10-1-14 ☑ Blue Ice ☐ Dry Ice ☐ None

| | | | |
|---|---|---|---|
| Yes ☑ | No ☐ | NA ☐ | 3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.) |
| Yes ☐ | No ☑ | NA ☐ | 4. Is the commercial courier's packing slip attached to this form? |
| Yes ☑ | No ☐ | | 5. Were proper custody procedures (relinquished/received) followed? |
| Yes ☐ | No ☑ | NA ☐ | 5a Were samples relinquished by client to commercial courier? |
| Yes ☑ | No ☐ | | 6. Were sample IDs listed on the COC? |
| Yes ☑ | No ☐ | | 7. Were sample IDs listed on all sample containers? |
| Yes ☑ | No ☐ | | 8. Was collection date & time listed on the COC? |
| Yes ☑ | No ☐ | | 9. Was collection date & time listed on all sample containers? |
| Yes ☑ | No ☐ | | 10. Did all container label information (ID, date, time) agree with the COC? |
| Yes ☑ | No ☐ | | 11. Were tests to be performed listed on the COC? |
| Yes ☑ | No ☐ | | 12. Did all samples arrive in the proper containers for each test? |
| Yes ☑ | No ☐ | | 13. Did all containers arrive in good condition (unbroken, lids on, etc.)? |
| Yes ☑ | No ☐ | | 14. Was adequate sample volume available? |
| Yes ☑ | No ☐ | | 15. Were all samples received within ½ the holding time or 48 hours, whichever comes first? |
| Yes ☐ | No ☑ | | 16. Were any samples containers missing? |
| Yes ☐ | No ☑ | KWP 10-1-14 | 17. Were there any excess samples not listed on COC? |
| Yes ☐ | No ☐ | NA ☑ | 18. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials? |
| Yes ☐ | No ☑ | NA ☑ | 19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2? |
| Yes ☐ | No ☐ | NA ☑ | 20. Were all cyanide and/or sulfide samples received at a pH >12? |
| Yes ☐ | No ☐ | NA ☑ | 21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine? |
| Yes ☐ | No ☐ | NA ☑ | 22. Were collection temperatures documented on the COC for NC samples? |
| Yes ☐ | No ☐ | NA ☑ | 23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS? |
| Yes ☐ | No ☑ | | 24. Was the quote number used taken from the container label? |

**Sample Preservation** (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ ($H_2SO_4$,$HNO_3$,HCl,NaOH) using SR # _____.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L (If #21 is No)

SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____
Sample(s) _____ were not received at a pH of <2 and were adjusted accordingly using SR# _____

Sample labels applied by: KWP Verified by: _____ Date: 10-1-14

Comments:
CAWR-14-869469 on COC not marked for analysis
did not receive bottles

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ACP

COC/Lab Request #: 2015-4



Client Contact:

Lab Agreement # : 63641-001-10

Project Number :

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-86942 | Sep 29 2014 | 10:21 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 10/1/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86942

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 9/29/2014 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | | 1021 | MEDIA: | UA | |
| PRS ID: | | OK | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Spring 1 | | | FIELD PREP: | UF | OK |
| LOCATION TYPE: SPR | | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NM | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NM |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | 3 | ICE 10/9/14 | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

| | | | |
|---|---|---|---|
| **EVENT ID:** | 6888 | **EVENT NAME:** | White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event |
| **SAMPLE ID:** | CAWR-14-86942 | **WORK ORDER:** | NA |

**SAMPLE COMMENTS:** N/A

**LOCATION COMMENTS:** N/A

**FIELD PARAMETERS:**

Dissolved Oxygen 6.18 mg/L Flow (in gpm) 3.14 GPM Oxidation-Reduction Potential 183.3 mV

pH 7.78 SU Specific Conductance 216 uS/cm Temperature 18.94 deg C

Turbidity 3.5 NTU

**COLLECTED BY (PRINT)** S, Acmack, K Reid

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) ANDREW VIGIL<br>(Signature) | 9/29/14 1620 | (Printed Name) S. Sherwood<br>(Signature) | 9/29/14 1620 |
| **RELINQUISHED BY**<br>**(Printed Name)**<br>**(Signature)** | **Date/Time** | **RECEIVED BY**<br>**(Printed Name)**<br>**(Signature)** | **Date/Time** |

Report Date 09/16/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-4

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| ARS1-14-02665 | Generic:Low_Level_Tritium | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-14-02665 | Generic:Low_Level_Tritium | ARS1-B14- | ARS1-B14- | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| Generic:Low_Level_Tritium | RAD | CAWR-14-86942 | ARS1-B14-02653-04 | REG | 1 | 0 | 0 | 0 |
| Generic:Low_Level_Tritium | RAD | LCS | ARS1-B14-02653-01 | LCS | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | LCSD | ARS1-B14-02653-02 | LCSD | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | MB | ARS1-B14-02653-03 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

# DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02653-01 | ARS1-B14-02653-02 | Generic:Low_Level_Tritium | Tritium | ARS1-B14-02653 | 11-14-2014 | W | 160.00 | 91.000 | 120.00 | 80.000 | | 10 | 54.510 | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 1 | 2015-4 | CAWR-14-86942 | REG | INIT | RAD | Generic:Low_Level_Tritiu | Tritium | | U | R11 | N | 3.1290 | pCi/L | 3.1290 | pCi/L | 3.0490 | 1.0710 | W | 09/29/2014 | | ARS1-B14-02653 | VAL | Y |

| Reason Code | Description |
|---|---|
| R11 | The results for the affected analytes should be regarded as not-detected (U) because the associated sample concentration was less than 3x the 1 sigma TPU. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86942 | Spring 1 | REG | Generic:Low_Level_Tritium | 0 | 1 |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Request Number: 2015-4

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory Request: 2015-4

# Original COC

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ACZP

**COC/Lab Request #:** 2015-4



**Client Contact:**

**Lab Agreement # :** 63641-001-10
**Project Number :**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-86942 | Sep 29 2014 | 10:21 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Montoya | 10/1/14 3:20 | | Ryan Newman | 10-2-14 1238 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory Request: 2015-4

# Case Narrative

ARS INTERNATIONAL

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November 18, 2014

LANL
Keith Greene
PO Box 1663 MS M992
Los Alamos, NM 87545

Request Number: **2015-4**
LANL Sample ID: **CAWR-14-86942**

Dear Mr. Greene;

On October 2, 2014, ARS International received one (1) water sample to be analyzed for Low Level Tritium. Analysis had to be rerun due to an explosion – correspondence is included in "Folder Duplicate" section.

Sample was counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The client and QA/QC samples were counted with a count time sufficient to meet quality control parameters for counting equipment and were within acceptance criteria and statistical sound detection limits.

If you have any questions please do not hesitate to call at 225.381.2991 or email LANL@amrad.com.

Sincerely,

James D. Pu

Laboratory Management
**ARS International**

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# COVER PAGE

**PROJECT SAMPLE IDENTIFICATION**
**CROSS-REFERENCE**
## TO ARS SAMPLE LABORATORY IDs
Subcontract (LANL Agreement Number) 250953

| Request Number | LANL PROJECT SAMPLE ID NUMBER | American Radiation Services SAMPLE ID NUMBER(S) |
|---|---|---|
| 2015-4 | CAWR-14-86942 | ARS1-14-02665-001 |

**SAMPLE RECEIPT**
The samples were received in good condition. The samples were screened for radioactive contamination as per procedure **ARS-062 "Sample Receiving"**. A 28-day turnaround was requested on the chain of custody.

**ANALYTICAL METHODS**
Tritium analyses were performed using **ARS-040, "Tritium Assay in Water Samples Using Electrolytic Enrichment".**

**ANALYTICAL RESULTS**
Analysis had to be repeated because original sample was lost during an explosion. The remainder of parent sample was used (355 ml).
DER and RER passed with 2 sigma error but was outside the acceptance range for 1 sigma error.

**American Radiation Services Project Manager/Laboratory Director's Comments:**
*"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."*

*"I certify that this electronic image and all hardcopies produced from this image accurately represent the data and are in compliance with the LANL specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."*

| James D. Lee | Laboratory Management, ARS International | 11-18-2014 |
|---|---|---|
| **Signature** | **Title** | **Date** |

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# ARS International, LLC

## Laboratory Analysis Report

## ARS1-14-02665

*Prepared for:*

**Los Alamos National Laboratory**

**Keith Greene**
**P.O. Box 1663**
**MS M992**
**Los Alamos, NM 87545**
**kgreene@lanl.gov**

**Phone: 505-665-9966**
**Fax: 505-665-9972**

Susan Leese
**Project Manager Review**

James D. Pu
**Management Review**

Notes: ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

**Contact Person: Questions regarding this analytical report should be addressed to:**

**Project Manager**

**ProjectManagers@amrad.com**

**Phone: 225.381.2991**
**Fax: 225.381.2996**

ACLASS ACCREDITED DoD ELAP

**LELAP Cert# 01949**

ARS INTERNATIONAL
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# Notes:

## Comments:

1.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.

2.0) Data in this report are within the limits of uncertainty specified in the reference method unless otherwise specified.

3.0) Modified analysis procedures are procedures that are modified to meet the certain specifications. An example may be the use of a water method to analyze a solid matrix due to the lack of an officially recognized procedure for the analysis of the solid matrix. Modified analyses are indicated by the subsequent addition of "m" to the procedure number (i.e. 900.0M).

4.0) Derived Air Concentrations and Effluent Release Concentrations are obtained from 10 CFR 20 Appendix B.

5.0) **Total activity** is actually total gamma activity and is determined utilizing the prominent gamma emitters from the naturally occurring radioactive decay chains and other prominent radioactive nuclides. Total activity may be lower than the actual total activity due to the extent of secular equilibrium achieved in the various decay chains at the time of analysis. The total activity is not representative of nuclides that emit solely alpha or beta particles.

6.0) Ra-228 is determined via secular equilibrium with its daughter, Actinium 228 (Gamma Spectroscopy only).

7.0) U-238 is determined via secular equilibrium with its daughter, Thorium 234 (Gamma Spectroscopy only).

8.0) All gamma spectroscopy was performed utilizing high purity germanium detectors (**HPGe**).

9.0) ARS makes every attempt to match sample density to calibrated density; however, in some cases, it is not practical or possible to do so and data results may be affected (Gamma Spectroscopy only).

10.0) Gamma spectroscopy results are calculated values based on the **ORTEC**® GammaVision ENV32 Analysis Engine.

11.0) ACLASS DOD and ISO 17025 certification applies only to the following analytes and methods: Gross Alpha and Gross Beta (EPA 900, SM7110B&C, SW846 9310); Radium 226 (EPA 903, EPA 903.1, SM 7500 Ra-B, SW846 9315); Radium 228 (EPA 904, SM 7500 Ra-B SW846 9320); Iodine-131(EPA 901.1); Uranium by ICPMS (EPA 200.8); Strontium 89/90 (EPA 905, Eichrom SRW01, HASL 300 Sr-03-RC); Tritium (EPA 906, EPA 906M); Gamma Emitters (EPA 901.1, SM7120B, HASL 300 Ga-01-R); Americium-241, Curium 242/244, Plutonium 239/240 and 241, Thorium 228/230/232, Uranium 234/233 and 238 (Eichrom ACW03 VBS); Lead 210 (HASL 300 Pb-01-RC, Eichrom OTW01); Polonium 210 (HASL 300 Po-01-RC, HASL 300 Po-02-RC); Technetium-99 (Eichrom TCW02, Eichrom TCS01M).

## Method References:

1.0) **EPA 600/4-80-032**; Prescribed Procedures for the Measurements of Radioactivity in Drinking Water, August 1980.

2.0) Standard Methods for Examination of Water and Waste Water, 18th, 1992.

3.0) **EPA SW-846**; Test Methods for Evaluating Solid Waste, Third Edition, (9/86). (Updated through 1995).

4.0) **EPA 600/4/79-020**; Methods for Chemical Analysis of Water and Waste, March 1983.

5.0) **HASL 300**

6.0) **ARS-040**; An LCSD is not reported with this process. The criteria for the LCS/LCSD analysis for reproducibility have not been established for Low Level Tritium analysis. A prepared standard for Low Level Tritium has not been developed. As a result, the standard we use is based on the dilution of a verified conventional tritium standard. The volume required for Low Level Tritium analysis, in addition to the lack of an available Low Level Tritium standard, introduce variability into the LCS/LCSD analysis that does not represent the actual sample analysis. The preferred measure for reproducibility is to run a duplicate analysis of a sample.

## Definitions:

| | | |
|---|---|---|
| 1.0) | **ND** | Not detected above the detection limit (non-detect). |
| 2.0) | **MDC** | (Minimum Detectable Concentration) minimum concentration of the analyte that ARS can detect utilizing the specific analysis |
| 3.0) | **MBL** | Method Blank |
| 4.0) | **DO** | Duplicate Original |
| 5.0) | **DUP** | Method Duplicate |
| 6.0) | **MS/MSD** | Matrix Spike/Matrix Spike Duplicate |
| 7.0) | **S** | Spike |
| 8.0) | **RS** | Reference Spike |
| 9.0) | ***SC** | Subcontracted out to another qualified laboratory |
| 10.0) | **NR** | Not Referenced |
| 11.0) | **N/A** | Not Applicable |
| 13.0) | **U** | Activity is below the MDC |
| 14.0) | **LCS/LCSD** | Laboratory Control Standard/Laboratory Control Standard Duplicate |
| 15.0) | **DLC** | Decision Level Concentration (ANSI N42.23) or critical level |

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***LELAP Cert# 01949*** ***NELAP Cert# E87558***

*ARS-059-010*
*Revision: 3*
*Revision Date: 100314*

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

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| | | | |
|---|---|---|---|
| **ARS Sample Delivery Group:** | ARS1-14-02665 | **Request or PO Number:** | 2015-4 |
| **Client Sample ID:** | CAWR-14-86942 | **ARS Sample ID:** | ARS1-14-02665-001 |
| **Sample Collection Date:** | 09/29/14 | **Date Received:** | 10/02/14 |
| **Sample Matrix:** | Aqueous | **Report Date:** | 11/17/14 |

| Analysis Description | Analysis Results | CSU +/- 2 s | MDC | DLC | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|---|---|---|---|---|---|---|---|---|---|---|
| Enriched H-3 | 3.129 | 1.071 | 3.049 | 1.468 | | pCi/L | ARS-040 | 11/13/14 15:30 | JPB | NA |
| | | | | | | | | | | |
| | | | | | | | | | | |

**NOTES: Analytical Contract 250953**

Project Manager Review

***Notes:*** *ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself.*
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*The results in this report pertain only to the samples tested and are intended solely for the use of the client.*

LELAP Certificate# 01949

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# QC Results Report

**Sample Delivery Group:** ARS1-14-02665
**Date Received:** 10/2/2014

## Laboratory Control Sample Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Percent Recovery (%) | LCS Acceptance Range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02653 | LCS | H3 | 21.998 | 3.489 | 2.507 | 24.056 | | pCi/L | ARS-040 | 11/13/14 9:19 | JPB | 91 | 80%-120% |

## Blank Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02653 | MBL | H3 | 1.653 | 0.685 | 2.052 | NA | U | pCi/L | ARS-040 | 11/13/14 9:19 | JPB |

## Sample RER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | RER | RER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02653 | LCSD | H3 | 21.998 | 3.489 | 33.122 | 5.096 | | pCi/L | ARS-040 | 11/13/14 9:19 | JPB | 1.30 | < 1 |

## Sample DER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | DER | DER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02653 | LCSD | H3 | 21.998 | 3.489 | 33.122 | 5.096 | | pCi/L | ARS-040 | 11/13/14 9:19 | JPB | 3.60 | < 3 |

Project Manager Review

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LELAP Certificate# 01949 NELAP Certificate # E87558

# QC Evaluation

**EPA Method: ARS-040**
**Batch ID: ARS1-B14-02653**
**SDG's: ARS1-14-02665; 2837**

| | | | |
|---|---|---|---|
| LCS | 38.4820 | CSU (2s) | 11.6080 |
| LCSD | 21.9980 | CSU-D (2s) | 6.8380 |

**DER =** $\frac{\text{abs(LSC-LSCD)}}{\text{sqr((2s CSU/2)^2)+(( 2s CSU-D/2)^2)}}$ *at 1 sigma* = **< 3**

**DER** $\frac{16.484}{6.736169}$ = 2.447088 **< 3**

**% RPD=** $\frac{\text{ABS( LCS - LSCD)}}{\text{(LCS+LSCD)/2}}$ * 100 = **< 25%**

**%RPD** $\frac{16.484}{30.24}$ *100 = 54.51058 **< 25%**

The *RPD* shall be less than 25% or other client-applied criteria

**RER=** $\frac{\text{abs((LCS-LCSD))}}{\text{(CSU)+(CSD)}}$ *at 2 sigma* = **<1** ***<--LANL Requirement***

**RER =** $\frac{16.484}{18.4460}$ 0.893635477 **<1**

**Blank Information**

| | Act | CSU(2s) | MDA | Act>MDA |
|---|---|---|---|---|
| **AM-241** | | | | |
| **U-234** | | | | |
| **U-235** | | | | |
| **U-238** | | | | |
| **Pu-238** | | | | |
| **Pu-239/240** | | | | |
| **Th-228** | | | | |
| **Th-230** | | | | |
| **Th-232** | | | | |
| **H3** | 1.653 | 1.342 | 2.052 | |
| **Ra-226** | | | | |
| **Ra-228** | | | | |
| **Total U** | | | | |
| **Pb-210** | | | | |
| **Po-209** | | | | |
| **Sr-90** | | | | |
| **TC-99** | | | | |
| **NI-63** | | | | |

*MDA should be below RDL
*Blank activity must be below MDA
*Blank activity must be < 1.65*CSU (DOE only)

ACT = 1.653
CSU = 1.342
Is ACT<1.65*CSU? YES

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-02653**

| Method | ARS-040 | Analysis | LSC-A-022 | Matrix | AQ |
|---|---|---|---|---|---|
| Description | Low Level Tritium by Electrolytic Enrichment | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02653-01 | LCS | B-17709 | | | | | | | | |
| ARS1-B14-02653-02 | LCSD | B-17710 | | | | | | | | |
| ARS1-B14-02653-03 | MBL | | | | | | | | | |
| ARS1-B14-02653-04 | TRG | | | | **ARS1-14-02665** | 001 | 1 | CAWR-14-86942 | STD | 10/27/14 |
| ARS1-B14-02653-05 | TRG | | | | **ARS1-14-02837** | 001 | 1 | CAMO-14-87135 | STD | 11/12/14 |
| ARS1-B14-02653-06 | TRG | | | | **ARS1-14-02837** | 002 | 1 | CAMO-14-87136 | STD | 11/12/14 |
| ARS1-B14-02653-07 | TRG | | | | **ARS1-14-02837** | 003 | 1 | CAMO-14-87138 | STD | 11/12/14 |
| ARS1-B14-02653-08 | TRG | | | | **ARS1-14-02837** | 004 | 1 | CAMO-14-87139 | STD | 11/12/14 |
| ARS1-B14-02653-09 | TRG | | | | **ARS1-14-02837** | 005 | 1 | CAMO-14-87126 | STD | 11/12/14 |

American Radiation Services
Baton Rouge Laboratory

# LCS Report
## Analytical Batch: ARS1-B14-02653



| BlindID | ABatch | ABatchSampleID | BlindGroup | StdID | Isotope | ExpectedAddition | ExpectedValue | EmptyWt | GrossWt | NetWt | UserID | ModDate | ExpectedValue_CT | MidPointCountDate | KnownValue |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-17709 | ARS1-B14-02653 | ARS1-B14-02653-01 | B-H3 | S-0289 | H-3 | 5 | 2.40549347 | 13.285 | 18.316 | 5.031 | AMRAD\BSTEFFENS | 10/21/2014 | 2.396616903 | 11/14/2014 | 12.05737964 |
| B-17710 | ARS1-B14-02653 | ARS1-B14-02653-02 | B-H3 | S-0289 | H-3 | 5 | 2.40549347 | 13.26 | 18.268 | 5.008 | AMRAD\BSTEFFENS | 10/21/2014 | 2.396986105 | 11/13/2014 | 12.00410642 |

# ARS-040



| ID_31001_040 | ABatch | AnalysisCode | ABatchSampleID | ClientID | IC_ID | S01_1_EnrichCellNo |
|---|---|---|---|---|---|---|
| 1249 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-01 | | | 0 |
| 1250 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-02 | | | 0 |
| 1251 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-03 | | | 0 |
| 1252 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-04 | CAWR-14-86942 | | 0 |
| 1253 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-05 | CAMO-14-87135 | | 0 |
| 1254 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-06 | CAMO-14-87136 | | 0 |
| 1255 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-07 | CAMO-14-87138 | | 0 |
| 1256 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-08 | CAMO-14-87139 | | 0 |
| 1257 | ARS1-B14-02653 | LSC-A-022 | ARS1-B14-02653-09 | CAMO-14-87126 | | 0 |

| S01_2_TareCell | S01_3_TareResv | S02_GrossWtResv | S03_1_WtNa2O2 | C_GrossSampleAdded | S04_1_ElectrolSD |
|---|---|---|---|---|---|
| 317.68 | 212.02 | 713.23 | 2.01 | 501.21 | 10/24/2014 18:11:00 |
| 320.89 | 200.39 | 700.63 | 2.05 | 500.24 | 10/24/2014 18:11:00 |
| 324.11 | 216.34 | 717.9 | 2.02 | 501.56 | 10/24/2014 18:11:00 |
| 327.55 | 207.71 | 562.76 | 2.02 | 355.05 | 10/24/2014 18:11:00 |
| 320.1 | 200.72 | 702.68 | 2.05 | 501.96 | 10/24/2014 18:11:00 |
| 319.25 | 198.44 | 700.16 | 2.06 | 501.72 | 10/24/2014 18:11:00 |
| 318.88 | 207.2 | 707.52 | 2 | 500.32 | 10/24/2014 18:11:00 |
| 318.93 | 218.6 | 720.94 | 2.02 | 502.34 | 10/24/2014 18:11:00 |
| 319.2 | 201.75 | 702.6 | 2.02 | 500.85 | 10/24/2014 18:11:00 |

| S04_2_StartAmp | S04_3_StartBathC | S05_1_ElectrolED | S05_2_EndBathC | S05_3_EndCellWt | C_GrossSmplRec |
|---|---|---|---|---|---|
| 5 | 2 | 11/13/2014 08:21:00 | 2 | 545.54 | 15.84 |
| 5 | 2 | 11/12/2014 09:21:00 | 2 | 538.1 | 16.82 |
| 5 | 2 | 11/13/2014 12:30:00 | 2 | 554.86 | 14.41 |
| 5 | 2 | 11/12/2014 12:16:00 | 2 | 550.62 | 15.36 |
| 5 | 2 | 11/12/2014 12:26:00 | 2 | 534.03 | 13.21 |
| 5 | 2 | 11/13/2014 12:30:00 | 2 | 531.77 | 14.08 |
| 5 | 2 | 11/13/2014 12:30:00 | 2 | 540.7 | 14.62 |
| 5 | 2 | 11/12/2014 12:31:00 | 2 | 554.51 | 16.98 |
| 5 | 2 | 11/13/2014 08:43:00 | 2 | 537.48 | 16.53 |

| C_EnrichmentF | S06_TareWt | S07_GrossWt | C_RecoveredWa | S08_TearWtLSCVial | S09_VialPlusSmpl | C_NetSample |
|---|---|---|---|---|---|---|
| 31.64204545 | 111.17 | 121.95 | 10.78 | 6.45 | 16.46 | 10.01 |
| 29.74078478 | 100.66 | 112.39 | 11.73 | 6.61 | 16.61 | 10 |
| 34.80638446 | 117 | 126.38 | 9.38 | 6.62 | 15.93 | 9.31 |
| 23.11523438 | 108 | 117.67 | 9.67 | 6.62 | 16.09 | 9.47 |
| 37.998486 | 117.19 | 125.84 | 8.65 | 6.37 | 14.84 | 8.47 |
| 35.63352273 | 103.53 | 112.91 | 9.38 | 6.45 | 15.65 | 9.2 |
| 34.22161423 | 96.72 | 107.32 | 10.6 | 6.5 | 16.58 | 10.08 |
| 29.58421673 | 92.33 | 104.95 | 12.62 | 6.5 | 16.55 | 10.05 |
| 30.29945554 | 109.89 | 121.58 | 11.69 | 6.53 | 16.56 | 10.03 |

| S10_1_WtVislSmplDrWatFill | C_NetDeadWaterAdded | C_TareWtBFCocktail | S10_2_GrossWtVSC | C_NetWtCocktailAdded |
|---|---|---|---|---|
| 16.46 | 0 | 16.46 | 26.75 | 10.29 |
| 16.61 | 0 | 16.61 | 26.89 | 10.28 |
| 16.62 | 0.69 | 16.62 | 26.88 | 10.26 |
| 16.64 | 0.55 | 16.64 | 26.92 | 10.28 |
| 16.37 | 1.53 | 16.37 | 26.65 | 10.28 |
| 16.56 | 0.91 | 16.56 | 26.81 | 10.25 |
| 16.58 | 0 | 16.58 | 26.85 | 10.27 |
| 16.55 | 0 | 16.55 | 26.8 | 10.25 |
| 16.56 | 0 | 16.56 | 26.83 | 10.27 |

| UserID | ModDate |
|---|---|
| AMRAD\JBYRD | 11/13/2014 12:11:58 |
| AMRAD\JBYRD | 11/12/2014 16:33:24 |
| AMRAD\JBYRD | 11/13/2014 16:35:59 |
| AMRAD\JBYRD | 11/12/2014 16:46:42 |
| AMRAD\JBYRD | 11/12/2014 15:47:46 |
| AMRAD\JBYRD | 11/13/2014 17:07:11 |
| AMRAD\JBYRD | 11/13/2014 17:14:07 |
| AMRAD\JBYRD | 11/12/2014 16:00:19 |
| AMRAD\JBYRD | 11/13/2014 12:17:54 |

| ARS-040 Calculation Results | |
|---|---|
| **ARS1-B14-02653** | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Total_Bkg_Count_Duration_min | DF | Sample_Activity_Conc | Standard_Counting_Uncertainty | CU_1 | CSU_1 | CU_1_96 | CSU_1_96 | MDC | DLC | ActivityReportUnits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02653-01 | 240.000 | 0.90056 | 38.482 | 1.325 | 1.325 | 5.922 | 2.597 | 11.608 | 2.413 | 1.162 | pCi |
| LSC-A-022 | ARS1-B14-02653-02 | 240.000 | 0.90070 | 21.998 | 1.134 | 1.134 | 3.489 | 2.222 | 6.838 | 2.507 | 1.208 | pCi |
| LSC-A-022 | ARS1-B14-02653-03 | 240.000 | 0.99985 | 1.653 | 0.638 | 0.638 | 0.685 | 1.251 | 1.342 | 2.052 | 0.989 | pCi |
| LSC-A-022 | ARS1-B14-02653-04 | 240.000 | 0.99309 | 3.129 | 0.962 | 0.962 | 1.071 | 1.886 | 2.098 | 3.049 | 1.468 | pCi |
| LSC-A-022 | ARS1-B14-02653-05 | 240.000 | 0.99554 | 33.122 | 1.135 | 1.135 | 5.096 | 2.224 | 9.988 | 2.060 | 0.992 | pCi |
| LSC-A-022 | ARS1-B14-02653-06 | 240.000 | 0.99524 | 1.967 | 0.639 | 0.639 | 0.704 | 1.252 | 1.379 | 2.032 | 0.979 | pCi |
| LSC-A-022 | ARS1-B14-02653-07 | 240.000 | 0.99539 | 1.584 | 0.611 | 0.611 | 0.656 | 1.198 | 1.286 | 1.967 | 0.947 | pCi |
| LSC-A-022 | ARS1-B14-02653-08 | 240.000 | 0.99539 | -0.083 | 0.678 | 0.678 | 0.678 | 1.329 | 1.329 | 2.323 | 1.119 | pCi |
| LSC-A-022 | ARS1-B14-02653-09 | 240.000 | 0.99539 | 0.659 | 0.675 | 0.675 | 0.682 | 1.323 | 1.337 | 2.254 | 1.086 | pCi |

| ARS-040 Calculation Results | |
|---|---|
| **ARS1-B14-02653** | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | AliquotReportUnits | UserID | ModDate |
|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02653-01 | L | AMRAD\JBYRD | 11/17/2014 |
| LSC-A-022 | ARS1-B14-02653-02 | L | AMRAD\JBYRD | 11/17/2014 |
| LSC-A-022 | ARS1-B14-02653-03 | L | AMRAD\JBYRD | 11/17/2014 |
| LSC-A-022 | ARS1-B14-02653-04 | L | AMRAD\JBYRD | 11/17/2014 |
| LSC-A-022 | ARS1-B14-02653-05 | L | AMRAD\JBYRD | 11/17/2014 |
| LSC-A-022 | ARS1-B14-02653-06 | L | AMRAD\JBYRD | 11/17/2014 |
| LSC-A-022 | ARS1-B14-02653-07 | L | AMRAD\JBYRD | 11/17/2014 |
| LSC-A-022 | ARS1-B14-02653-08 | L | AMRAD\JBYRD | 11/17/2014 |
| LSC-A-022 | ARS1-B14-02653-09 | L | AMRAD\JBYRD | 11/17/2014 |
| | | | | |

| ARS-040 Calculation Results | |
|---|---|
| **ARS1-B14-02653** | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Initial_Mass_sample_g | Mass_Na2O2_added_g | Final_mass_electrolyzed_sample_NaOH_g | Mass_equivalent_NaOH_g | Final_Mass_Electrolyzed_sample_g | VolumeFactor_X | Enrichment_Factor_Y |
|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02653-01 | 501.210 | 2.010 | 15.840 | 2.062 | 13.778 | 0.027 | 28.399 |
| LSC-A-022 | ARS1-B14-02653-02 | 500.240 | 2.050 | 16.820 | 2.103 | 14.717 | 0.029 | 26.606 |
| LSC-A-022 | ARS1-B14-02653-03 | 501.560 | 2.020 | 14.410 | 2.073 | 12.337 | 0.025 | 31.600 |
| LSC-A-022 | ARS1-B14-02653-04 | 355.050 | 2.020 | 15.360 | 2.073 | 13.287 | 0.037 | 21.112 |
| LSC-A-022 | ARS1-B14-02653-05 | 501.960 | 2.050 | 13.210 | 2.103 | 11.107 | 0.022 | 34.985 |
| LSC-A-022 | ARS1-B14-02653-06 | 501.720 | 2.060 | 14.080 | 2.114 | 11.966 | 0.024 | 32.551 |
| LSC-A-022 | ARS1-B14-02653-07 | 500.320 | 2.000 | 14.620 | 2.052 | 12.568 | 0.025 | 30.969 |
| LSC-A-022 | ARS1-B14-02653-08 | 502.340 | 2.020 | 16.980 | 2.073 | 14.907 | 0.030 | 26.385 |
| LSC-A-022 | ARS1-B14-02653-09 | 500.850 | 2.020 | 16.530 | 2.073 | 14.457 | 0.029 | 27.096 |
| | | | | | | | | |

| ARS-040 Calculation Results | |
|---|---|
| **ARS1-B14-02653** | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Average_Sample_CPM | Bkg_CPM | tSIE | Detector_Eff_decimal | Aliquot | AliqUnits | Activity_reference_date | Start_Date_of_Count | Sample_Count_Duration_min |
|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02653-01 | 5.885 | 0.975 | 375.970 | 0.225 | 0.01001 | L | 1/3/2013 | 11/14/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02653-02 | 3.676 | 0.975 | 393.800 | 0.231 | 0.01000 | L | 1/3/2013 | 11/13/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02653-03 | 1.223 | 0.975 | 390.720 | 0.230 | 0.00931 | L | 11/13/2014 | 11/14/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02653-04 | 1.291 | 0.975 | 388.920 | 0.229 | 0.00947 | L | 9/29/2014 | 11/13/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02653-05 | 5.925 | 0.975 | 386.550 | 0.228 | 0.00847 | L | 10/15/2014 | 11/13/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02653-06 | 1.273 | 0.975 | 388.830 | 0.229 | 0.00920 | L | 10/14/2014 | 11/14/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02653-07 | 1.223 | 0.975 | 382.620 | 0.227 | 0.01008 | L | 10/15/2014 | 11/14/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02653-08 | 0.964 | 0.975 | 380.850 | 0.226 | 0.01005 | L | 10/15/2014 | 11/13/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02653-09 | 1.065 | 0.975 | 384.070 | 0.227 | 0.01003 | L | 10/15/2014 | 11/14/2014 | 240.000 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141113_0458
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141113_0458\20141113_0458.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141113_0458\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141113_0458\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 240.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

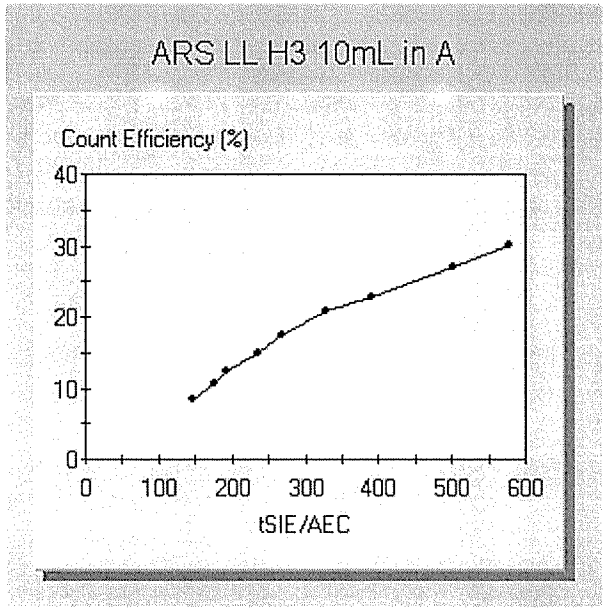
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | BACKGROUND | 0.975 | 4.43 | 362.80 | 21.99 | 240.00 | 11/13/2014 | 5:08:05 AM | |
| 2 | 2 | B14-02653-02 | 3.676 | 15.92 | 393.80 | 23.08 | 240.00 | 11/13/2014 | 9:19:09 AM | |
| 2 | 3 | B14-02653-04 | 1.291 | 5.64 | 388.92 | 22.91 | 240.00 | 11/13/2014 | 1:30:13 PM | |
| 2 | 4 | B14-02653-05 | 5.925 | 25.96 | 386.55 | 22.82 | 240.00 | 11/13/2014 | 5:41:16 PM | |
| 2 | 5 | B14-02653-08 | 0.964 | 4.26 | 380.85 | 22.62 | 240.00 | 11/13/2014 | 9:52:16 PM | |
| 2 | 6 | B14-02653-01 | 5.885 | 26.21 | 375.97 | 22.45 | 240.00 | 11/14/2014 | 2:03:18 AM | |
| 2 | 7 | B14-02653-09 | 1.065 | 4.68 | 384.07 | 22.74 | 240.00 | 11/14/2014 | 6:14:34 AM | |
| 2 | 8 | B14-02653-03 | 1.223 | 5.32 | 390.72 | 22.97 | 240.00 | 11/14/2014 | 10:25:39 AM | |
| 2 | 9 | B14-02653-06 | 1.273 | 5.56 | 388.83 | 22.90 | 240.00 | 11/14/2014 | 2:36:41 PM | |
| 2 | 10 | B14-02653-07 | 1.223 | 5.39 | 382.62 | 22.69 | 240.00 | 11/14/2014 | 6:47:43 PM | |

**ARS Batch Number:** ARS1-B14 - 02653

| Enter these Values for LCS | | | |
|---|---|---|---|
| | Current ACT | 5.3205 | Standards Report |
| | NetWt | 5.0310 | LCS Report |
| | Aliquot | 0.5012 | Procedural Data Report |

| Enter these Values for LCSD | | | |
|---|---|---|---|
| | Current ACT | 5.3205 | Standards Report |
| | NetWt | 5.0080 | LCS Report |
| | Aliquot | 0.5002 | Procedural Data Report |

## Expected Value Calculations

**ARS Batch Number:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **LCS** | **CALCULATED EXPECTED VALUE** | = | 24.0566 | | | |
| | | | **Range** | 18.0424 | - | 30.0707 |
| **LCSD** | **CALCULATED EXPECTED VALUE** | = | 23.9930 | | | |
| | | | **Range** | 17.9948 | - | 29.9913 |

# Standards Activity as of: 11/14/14 02:0

| Active | Std ID | Isotope | PSCLT | Verification Date | Exp Date | Status | Ref Date | Ref ACT (dpm) | ACT at Date Above (dpm/g) | Halflife (days) | Parent ID |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | **S-0289** | H-3 | **SL** | 01/07/14 | 01/07/15 | OK | 01/03/13 | 5.9080E+00 | **5.3205** | 4.500E+03 | **S-0237** |

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 11-5-14 | 17:18 | B14-02562 -02 | B14-02562 | 2148 | JB |
| ↓ | ↓ | ↓ -03 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -04 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | JB |
| 11-12-14 | 9:56 | SNC 16 | QA | QA | JB |
| ↓ | ↓ | Background | B14-02886 | 1138 | JB |
| ↓ | ↓ | B14-02886 -04 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -09 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -10 | ↓ | ↓ | JB |
| ↓ | | Background | B14-02653 | 0458 ~~1138~~ JB 11-13-14 | JB |
| ↓ | ↓ | B14-02653-02 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -04 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -01 | ↓ | ↓ | JB |

Reviewed By: _____ Initials Date: 11-13-14

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 11-12-14 | | B14-02653 -09 | B14-02653 | 0458 ~~1138~~ 11-13-14 | JB |
| ↓ | ↓ | ↓ -03 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | JB |
| | | | | | |
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N/A

11-17-14

JB



Reviewed By: SDR Date: 11-17-14
Initials

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

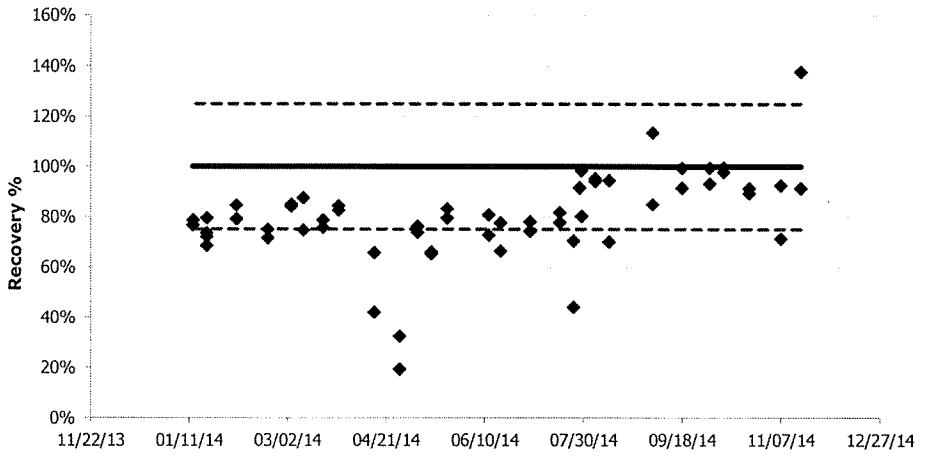
# Control Charts

American Radiation Services
Baton Rouge Laboratory

# QC Chart

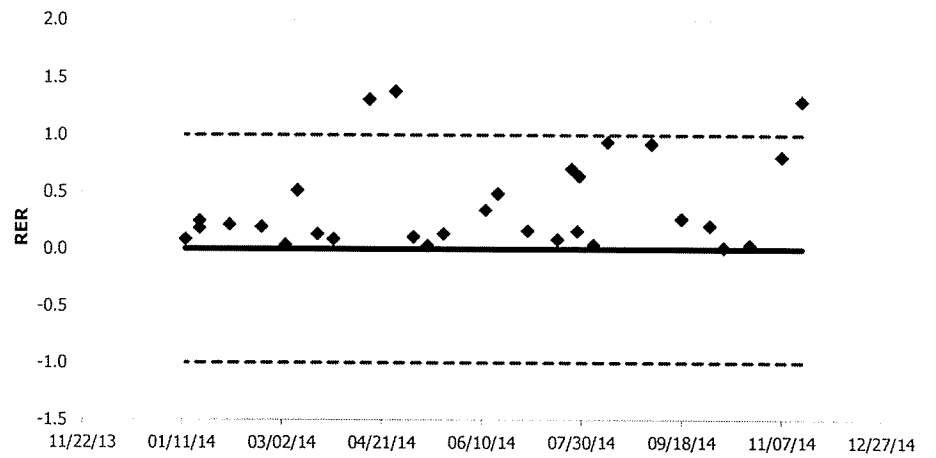


## LLH-3 LCS



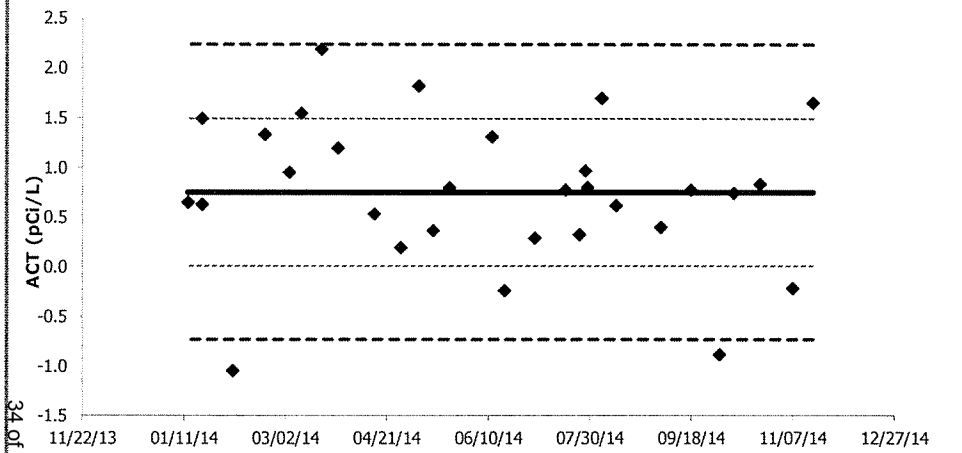

| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.8017 | 0.1769 | 30 | 1.2500 | 0.7500 |

## LLH-3 RER



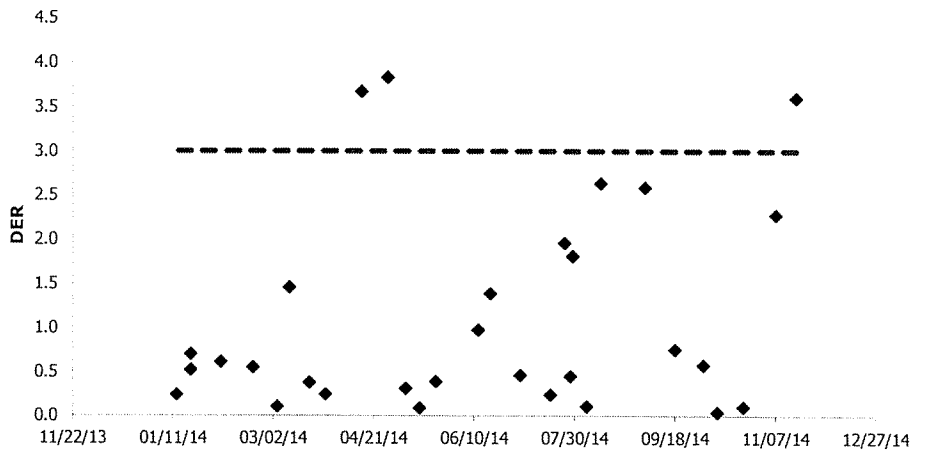

| | | n | UCL | LCL |
|---|---|---|---|---|
| | | 30 | 1.0000 | -1.0000 |

## LLH-3 Blank




| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.7505 | 0.7410 | 30 | 2.2325 | -0.7316 |

## LLH-3 DER

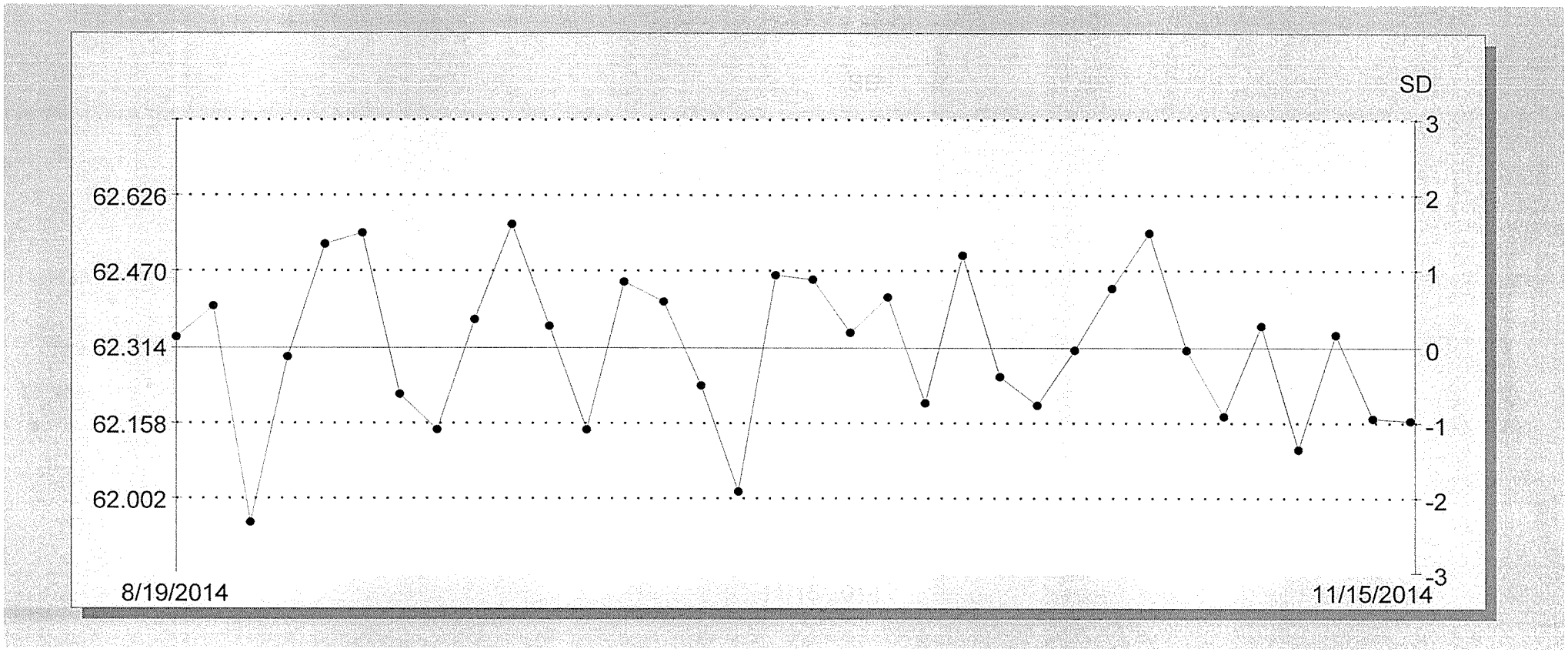



| | | n | UCL | |
|---|---|---|---|---|
| | | 30 | 3.0000 | |

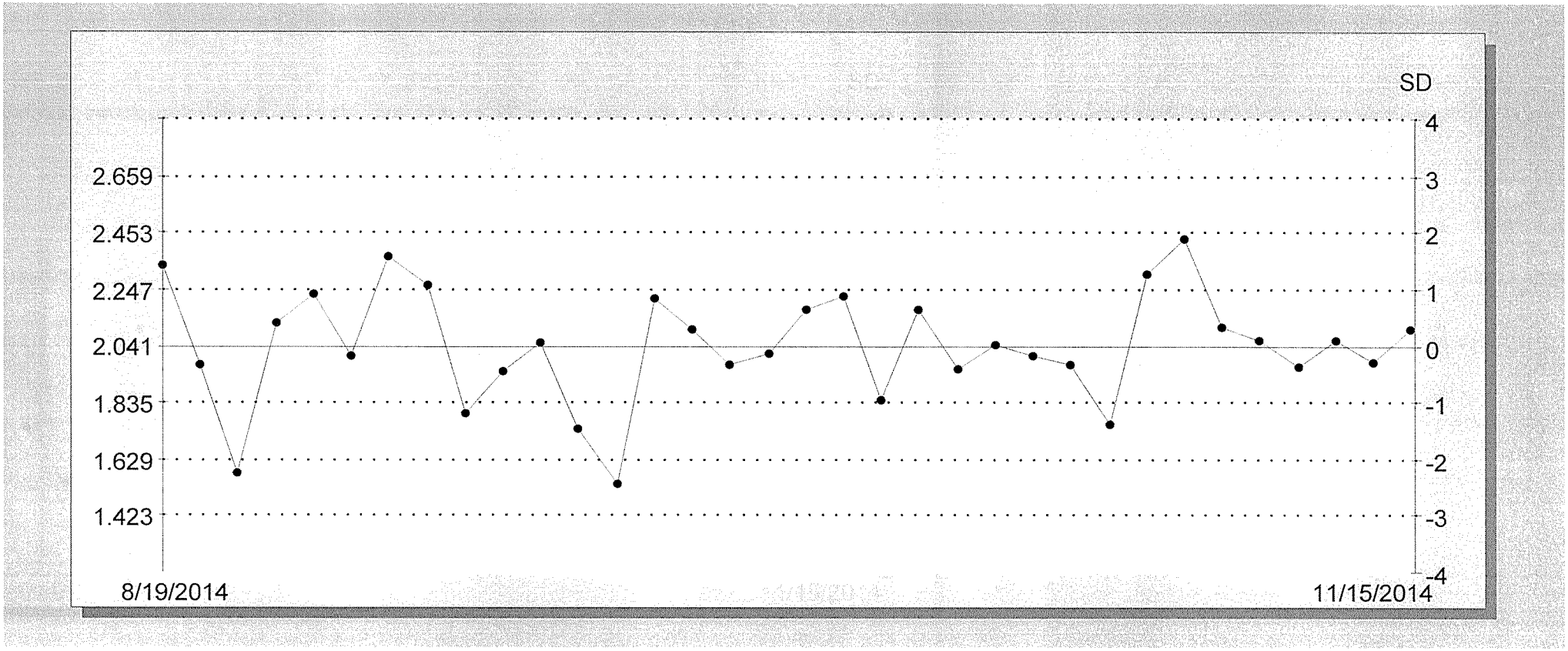
3H Efficiency
Total # pts : 5940
Valid # pts : 34
Mean : 62.31
SD : 0.16

| Date | Value | Valid Pt |
|---|---|---|
| Aug 19, 2014 | 62.33 | X |
| Aug 20, 2014 | 62.40 | X |
| Aug 22, 2014 | 61.95 | X |
| Aug 29, 2014 | 62.29 | X |
| Sep 04, 2014 | 62.53 | X |
| Sep 05, 2014 | 62.55 | X |
| Sep 08, 2014 | 62.22 | X |
| Sep 12, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.37 | X |
| Sep 14, 2014 | 62.57 | X |
| Sep 14, 2014 | 62.36 | X |
| Sep 14, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.45 | X |
| Sep 17, 2014 | 62.41 | X |
| Sep 18, 2014 | 62.23 | X |
| Sep 26, 2014 | 62.02 | X |
| Sep 28, 2014 | 62.46 | X |
| Oct 01, 2014 | 62.45 | X |
| Oct 02, 2014 | 62.34 | X |
| Oct 05, 2014 | 62.42 | X |
| Oct 07, 2014 | 62.20 | X |
| Oct 13, 2014 | 62.50 | X |
| Oct 21, 2014 | 62.25 | X |
| Oct 24, 2014 | 62.19 | X |
| Oct 27, 2014 | 62.31 | X |
| Oct 28, 2014 | 62.43 | X |
| Oct 29, 2014 | 62.55 | X |
| Oct 29, 2014 | 62.30 | X |
| Nov 03, 2014 | 62.17 | X |
| Nov 05, 2014 | 62.36 | X |
| Nov 05, 2014 | 62.10 | X |
| Nov 07, 2014 | 62.34 | X |
| Nov 12, 2014 | 62.17 | X |
| Nov 15, 2014 | 62.16 | X |

3H Efficiency
Total # pts : 5940
Valid # pts : 34
Mean : 62.31
SD : 0.16



3H Background
Total # pts : 5865
Valid # pts : 34
Mean : 2.04
SD : 0.21



3H Background
Total # pts : 5865
Valid # pts : 34
Mean : 2.04
SD : 0.21

| Date | Value | Valid Pt |
|---|---|---|
| Aug 19, 2014 | 2.33 | X |
| Aug 20, 2014 | 1.97 | X |
| Aug 22, 2014 | 1.58 | X |
| Aug 29, 2014 | 2.13 | X |
| Sep 04, 2014 | 2.22 | X |
| Sep 05, 2014 | 2.00 | X |
| Sep 08, 2014 | 2.36 | X |
| Sep 12, 2014 | 2.26 | X |
| Sep 14, 2014 | 1.79 | X |
| Sep 14, 2014 | 1.95 | X |
| Sep 14, 2014 | 2.05 | X |
| Sep 14, 2014 | 1.74 | X |
| Sep 14, 2014 | 1.54 | X |
| Sep 17, 2014 | 2.21 | X |
| Sep 18, 2014 | 2.10 | X |
| Sep 26, 2014 | 1.97 | X |
| Sep 28, 2014 | 2.01 | X |
| Oct 01, 2014 | 2.17 | X |
| Oct 02, 2014 | 2.22 | X |
| Oct 05, 2014 | 1.84 | X |
| Oct 07, 2014 | 2.17 | X |
| Oct 13, 2014 | 1.95 | X |
| Oct 21, 2014 | 2.04 | X |
| Oct 24, 2014 | 2.00 | X |
| Oct 27, 2014 | 1.97 | X |
| Oct 28, 2014 | 1.75 | X |
| Oct 29, 2014 | 2.30 | X |
| Oct 29, 2014 | 2.43 | X |
| Nov 03, 2014 | 2.11 | X |
| Nov 05, 2014 | 2.06 | X |
| Nov 05, 2014 | 1.96 | X |
| Nov 07, 2014 | 2.06 | X |
| Nov 12, 2014 | 1.98 | X |
| Nov 15, 2014 | 2.10 | X |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium- Screening by Low Level Liquid Scintillation Counting

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting

# Samples

***Procedures:*** **ARS-060** **ARS-040** *Section 14.1 Tritium Screen in Clean Water without Distillation*

***ARS File ID Numbers:*** ARS1-14-02665
***ARS Batch ID:*** ARS1-B14-02345

| | Sample ID: | COUNT TIME | CPMA | Background CPMA | Eff Nucl In A | Aliquot (grams) | ACTIVITY | units | MDA | Sample Must be analyzed as LSC-A-001 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | B14-02345-04 | 120 | 1.082 | 1.085 | 22.17 | 10.02 | -0.608 | pCi/L | 114.6241 | NO |
| 2 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 3 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 4 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 5 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 6 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 7 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 8 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 9 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 10 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 11 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 12 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 13 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 14 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 15 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 16 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 17 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 18 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 19 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 20 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 21 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 22 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 23 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-02345**

| Method | ARS-054 | Analysis | LSC-A-021 | Matrix | AQ |
|---|---|---|---|---|---|
| Description | Low Level Tritium Screening | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02345-01 | LCS | | | | | | | | | |
| ARS1-B14-02345-02 | LCSD | | | | | | | | | |
| ARS1-B14-02345-03 | MBL | | | | | | | | | |
| ARS1-B14-02345-04 | TRG | | | | **ARS1-14-02665** | 001 | 1 | CAWR-14-86942 | STD | 10/27/14 |

# ARS-054



| ID_31001_054 | ABatch | ABatchSampleID | ClientID | Aliquot1 | AliquotUnits1 | IC_ID1 | Aliquot2 | AliquotUnits2 | IC_ID2 | UserID | ModDate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14088 | ARS1-B14-02345 | ARS1-B14-02345-01 | | 1 | L | | | | | AMRAD\JBYRD | 10/02/2014 15:58:20 |
| 14089 | ARS1-B14-02345 | ARS1-B14-02345-02 | | 1 | L | | | | | AMRAD\JBYRD | 10/02/2014 15:58:20 |
| 14090 | ARS1-B14-02345 | ARS1-B14-02345-03 | | 1 | L | | | | | AMRAD\JBYRD | 10/02/2014 15:58:20 |
| 14091 | ARS1-B14-02345 | ARS1-B14-02345-04 | CAWR-14-86942 | 10.02 | L | 176294 | | | | AMRAD\JBYRD | 10/02/2014 15:58:20 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141002_1741
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141002_1741\20141002_1741.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141002_1741\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141002_1741\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_3.lsa

Count Conditions-

Nuclide: Low Level H3
   Quench Indicator: tSIE/AEC
   External Std Terminator (sec): 0.5 2s%
   Pre-Count Delay (min): 0.00
Quench Set:
   Low Energy: ARS LL H3 10mL
Count Time (min): 120.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

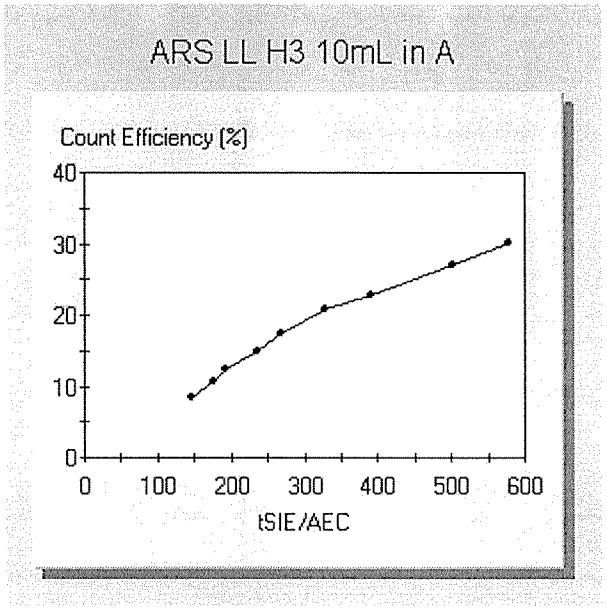
Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|
| A | | | | |
| B | | | | |
| C | | | | |

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |

| | |
|---|---|
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME |
|---|---|---|---|---|---|---|---|---|---|
| MESSAGES | | | | | | | | | |
| 10 | 1 | BACKGROUND | 1.085 | 5.09 | 343.12 | 21.30 | 120.00 | 10/2/2014 | 5:50:07 PM |
| 10 | 2 | B14-02345-04 | 1.082 | 4.88 | 367.92 | 22.17 | 120.00 | 10/2/2014 | 7:59:57 PM |

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 9-28-14 | 16:14 | B14-02066-05 | B14-02066 | 1749 | [illegible] |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | [illegible] |
| 10-1-14 | 8:30 | SNC16 | QA | QA | [illegible] |
| ↓ | ↓ | Background | B14-02316 | 1007 | [illegible] |
| ↓ | ↓ | B14-02316-04 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | [illegible] |
| 10-2-14 | 16:05 | SNC16 | QA | QA | [illegible] |
| ↓ | ↓ | Background | B14-02345 | 1741 | [illegible] |
| ↓ | ↓ | B14-02345-04 | ↓ | ↓ | [illegible] |
| 10-5-14 | 19:30 | SNC16 | QA | QA | [illegible] |
| ↓ | ↓ | Background | B14-02202 | 2059 | [illegible] |
| ↓ | ↓ | B14-02202-03 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -04 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -09 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -10 | ↓ | ↓ | [illegible] |



Reviewed By: [illegible] Date: 10-24-14
Initials

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

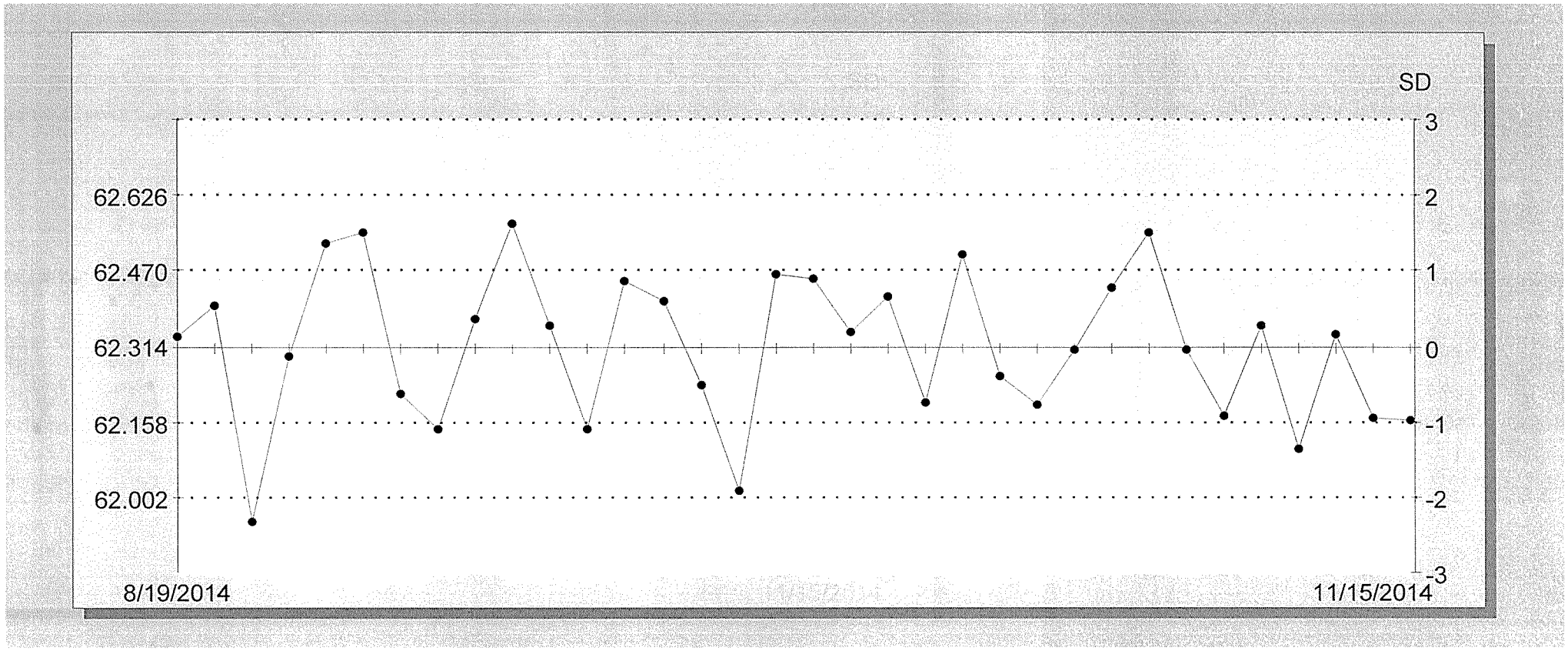
# Tritium-Screening by Low Level Liquid Scintillation Counting

# Control Charts

3H Efficiency
Total # pts : 5940
Valid # pts : 34
Mean : 62.31
SD : 0.16

| Date | Value | Valid Pt |
|---|---|---|
| Aug 19, 2014 | 62.33 | X |
| Aug 20, 2014 | 62.40 | X |
| Aug 22, 2014 | 61.95 | X |
| Aug 29, 2014 | 62.29 | X |
| Sep 04, 2014 | 62.53 | X |
| Sep 05, 2014 | 62.55 | X |
| Sep 08, 2014 | 62.22 | X |
| Sep 12, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.37 | X |
| Sep 14, 2014 | 62.57 | X |
| Sep 14, 2014 | 62.36 | X |
| Sep 14, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.45 | X |
| Sep 17, 2014 | 62.41 | X |
| Sep 18, 2014 | 62.23 | X |
| Sep 26, 2014 | 62.02 | X |
| Sep 28, 2014 | 62.46 | X |
| Oct 01, 2014 | 62.45 | X |
| Oct 02, 2014 | 62.34 | X |
| Oct 05, 2014 | 62.42 | X |
| Oct 07, 2014 | 62.20 | X |
| Oct 13, 2014 | 62.50 | X |
| Oct 21, 2014 | 62.25 | X |
| Oct 24, 2014 | 62.19 | X |
| Oct 27, 2014 | 62.31 | X |
| Oct 28, 2014 | 62.43 | X |
| Oct 29, 2014 | 62.55 | X |
| Oct 29, 2014 | 62.30 | X |
| Nov 03, 2014 | 62.17 | X |
| Nov 05, 2014 | 62.36 | X |
| Nov 05, 2014 | 62.10 | X |
| Nov 07, 2014 | 62.34 | X |
| Nov 12, 2014 | 62.17 | X |
| Nov 15, 2014 | 62.16 | X |

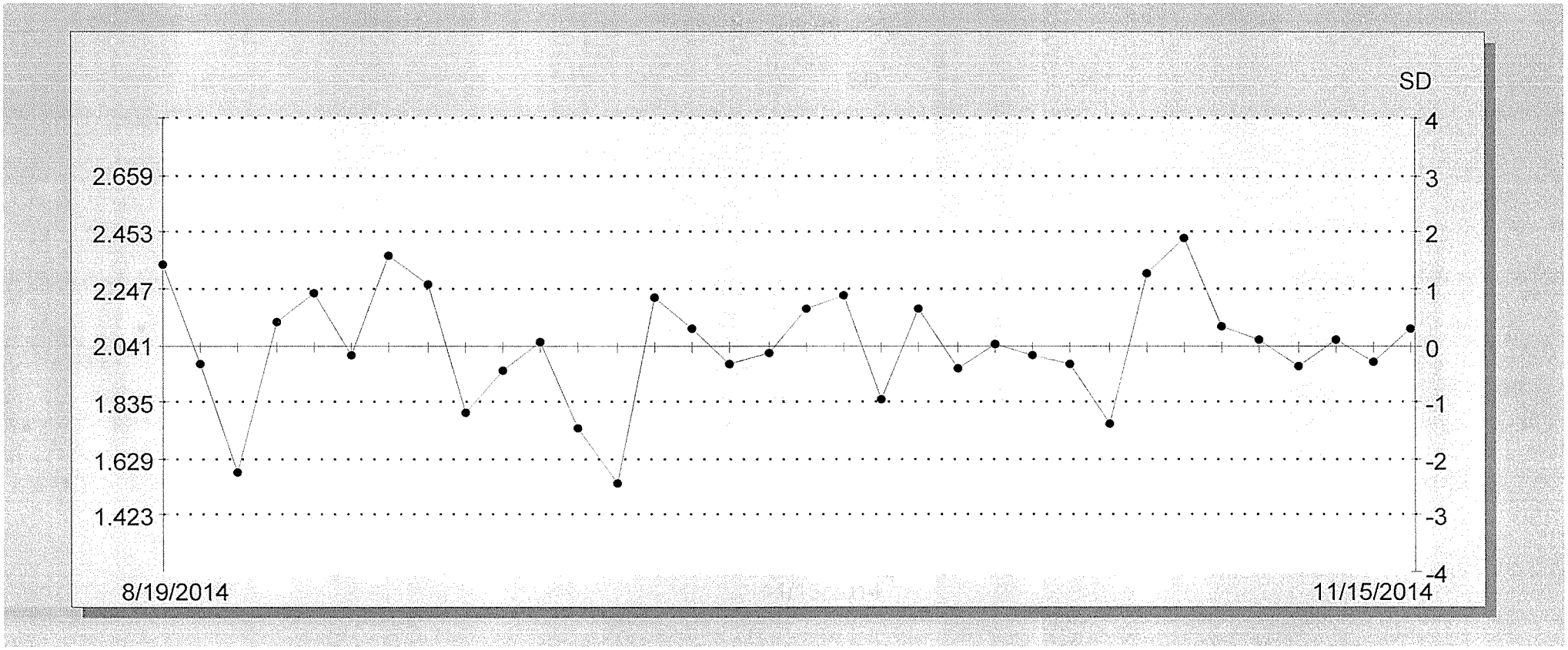
3H Efficiency
Total # pts : 5940
Valid # pts : 34
Mean : 62.31
SD : 0.16



3H Background
Total # pts : 5865
Valid # pts : 34
Mean : 2.04
SD : 0.21

| Date | Value | Valid Pt |
|---|---|---|
| Aug 19, 2014 | 2.33 | X |
| Aug 20, 2014 | 1.97 | X |
| Aug 22, 2014 | 1.58 | X |
| Aug 29, 2014 | 2.13 | X |
| Sep 04, 2014 | 2.22 | X |
| Sep 05, 2014 | 2.00 | X |
| Sep 08, 2014 | 2.36 | X |
| Sep 12, 2014 | 2.26 | X |
| Sep 14, 2014 | 1.79 | X |
| Sep 14, 2014 | 1.95 | X |
| Sep 14, 2014 | 2.05 | X |
| Sep 14, 2014 | 1.74 | X |
| Sep 14, 2014 | 1.54 | X |
| Sep 17, 2014 | 2.21 | X |
| Sep 18, 2014 | 2.10 | X |
| Sep 26, 2014 | 1.97 | X |
| Sep 28, 2014 | 2.01 | X |
| Oct 01, 2014 | 2.17 | X |
| Oct 02, 2014 | 2.22 | X |
| Oct 05, 2014 | 1.84 | X |
| Oct 07, 2014 | 2.17 | X |
| Oct 13, 2014 | 1.95 | X |
| Oct 21, 2014 | 2.04 | X |
| Oct 24, 2014 | 2.00 | X |
| Oct 27, 2014 | 1.97 | X |
| Oct 28, 2014 | 1.75 | X |
| Oct 29, 2014 | 2.30 | X |
| Oct 29, 2014 | 2.43 | X |
| Nov 03, 2014 | 2.11 | X |
| Nov 05, 2014 | 2.06 | X |
| Nov 05, 2014 | 1.96 | X |
| Nov 07, 2014 | 2.06 | X |
| Nov 12, 2014 | 1.98 | X |
| Nov 15, 2014 | 2.10 | X |

3H Background
Total # pts : 5865
Valid # pts : 34
Mean : 2.04
SD : 0.21



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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Liquid Scintillation Counting

# Calibration Information

ARS INTERNATIONAL

QUALITY CONTROL PROGRAM

AMERICAN RADIATION SERVICES
RADIOACTIVE REFERENCE SOLUTIONS

# ANNUAL ACTIVITY VERIFICATION

VERIFICATION DATE 1/7/2014 3:43 *date counted*
STANDARD REFERENCE # S-0289

| Principal Radionuclide | | Half Life, Years | | Half Life, Days |
|---|---|---|---|---|
| H-3 | *ENTER -->* | | *OR -->* | 4.4998E+03 |
| | | 1.232E+01 | | 4.4998E+03 |

Radionuclide H-3 Dilution Reference Date 1/3/2014 13:25

| | | | |
|---|---|---|---|
| Dilution Activity | 2.66 | pCi per gram ===> dpm/g | 5.91 |
| Verif. Date Decay Corrected | 2.66 | pCi per gram ===> dpm/g | 5.90 |

*Minimum of 3 Required*

| Trial ID | Sample Counts | Count Time (min) | Detector | Efficiency | Bkg. (cpm) | Net Weight | Decay Corrected Activity Result (dpm/g) | Decay Corrected Activity Result (pCi/g) |
|---|---|---|---|---|---|---|---|---|
| S-0289-V1 | 21.75 | 1 | LSC | 0.3549 | 10.54 | 5.019 | 6.29 | 2.83 |
| S-0289-V2 | 20.53 | 1 | LSC | 0.3546 | 10.54 | 4.993 | 5.64 | 2.54 |
| S-0289-V3 | 20.60 | 1 | LSC | 0.3546 | 10.54 | 4.996 | 5.68 | 2.56 |
| S-0289-V4 | 21.00 | 1 | LSC | 0.3547 | 10.54 | 5.005 | 5.89 | 2.65 |
| S-0289-V5 | 21.18 | 1 | LSC | 0.3542 | 10.54 | 4.993 | 6.02 | 2.71 |

| | | | |
|---|---|---|---|
| | Average | 5.90 | 2.66 |
| | Two Sigma Uncertainty | 0.52 | 0.24 |
| *10% Max* *PASS* | Standard Deviation percent of known concentration | 4.51% | 4.51% |
| | Target Activity | 5.90 | 2.66 |
| *5% Max* *PASS* | % Diff | 0.00% | 0.00% |

**Verification Expiration Date:** January 7, 2015

Prepared & Counted By [signature] Date: 1/7/2014 3:43

Verified & Approved By [signature] Date: 1-8-14

QC Approval [signature] Date: 1-8-14

**S-0289**
**H-3**
SL

| | |
|---|---|
| Manufactuer | NIST SRM 4927F |
| Sol Matrix | H2O |
| Ref No | NIST SRM 4927F |
| Tech | Unknown |
| Parent ID | S-0237 |

Verified 1/7/14
Expires **1/7/15**

ARS INTERNATIONAL
RADIOACTIVE STANDARDS – BATON ROUGE LABORATORY

Assay Definition-

Assay Description:
H3 Normal Lvl

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\20140106_1733.results
RTF File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\H3 Normal Lvl2.lsa

Count Conditions-

Nuclide: Standard H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: PE UG STD H3
Count Time (min): 120.00
Count Mode: Normal
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: n/a
Colored Samples: Off Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

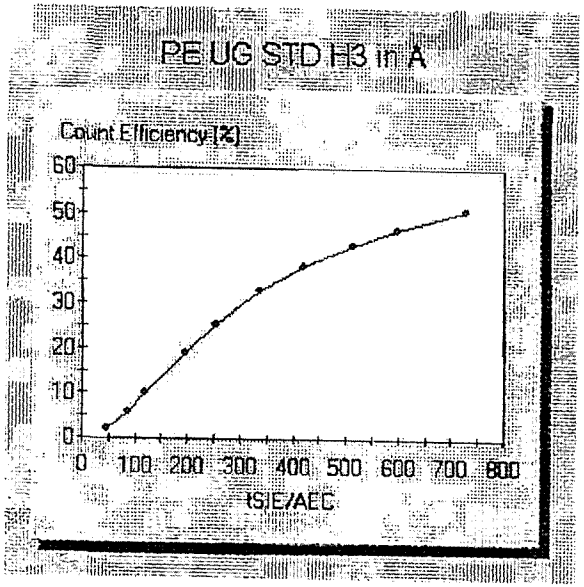
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 05/30/2013
Date Modified:
PE UG STD H3 in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 726.67 | 50.69 |
| 595.82 | 46.27 |
| 512.39 | 42.97 |
| 421.70 | 38.56 |
| 337.18 | 32.90 |
| 253.25 | 25.44 |
| 195.24 | 19.09 |
| 120.68 | 10.06 |
| 85.94 | 5.83 |
| 47.95 | 1.96 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | BACKGROUND | 10.54 | 29.70 | 375.63 | 35.48 | 120.00 | 1/6/2014 | 5:34:01 PM | |
| 20 | 2 | S-0289-V1 | 21.75 | 61.30 | 375.79 | 35.49 | 120.00 | 1/6/2014 | 7:35:52 PM | |
| 20 | 3 | S-0289-V2 | 20.53 | 57.89 | 375.34 | 35.46 | 120.00 | 1/6/2014 | 9:37:44 PM | |
| 20 | 4 | S-0289-V3 | 20.60 | 58.09 | 375.37 | 35.46 | 120.00 | 1/6/2014 | 11:39:36 PM | |
| 20 | 5 | S-0289-V4 | 21.00 | 59.21 | 375.58 | 35.47 | 120.00 | 1/7/2014 | 1:41:31 AM | |
| 20 | 6 | S-0289-V5 | 21.18 | 59.80 | 374.77 | 35.42 | 120.00 | 1/7/2014 | 3:43:23 AM | |

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

### Planning

| | |
|---|---|
| Planning Comments | Create an H-3 LCS standard |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.67265112 |
| Appx vol ml of Parent Sol'n | 3.679273813 |
| Expected Addition for Analysis g | 5 |

### Standards Preparation / Dilution

| | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 01/03/2013 13:25 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | 3.9375 |
| DPM Xferred on 01/03/2013 13:25 | 11793.25195 |
| Diluent/matrix | DI H2O |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.9 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | 2000 |
| Final Dilution Density (g/mL) | 0.99807 |
| Final Dilution Measured Mass g | 1996.14 |
| Comments | H3 LCS standard. Dilution performed as stated above by BSteffens on 1/3/13. BJS 1/3/13 |
| Final Dilution dpm/g | 5.908028472 |
| Final Dil New Ref Date/Time | 01/03/2013 13:25 |

## Parent Standard Data

| | | | | | |
|---|---|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | | | |
| Parent Solution # | S-0237 | | | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.8000000 | | |
| Parent Reference Date | 03/22/2010 10:10 | | | | |
| Parent Certified Act | 3503.682716 | Certi Act/Vol Units | dpm | / | g |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | | | |
| Parent Supplier | NIST SRM 4927F | | | | |
| Parent Date Recvd | 01/02/00 | | | | |
| Parent Received By | Unknown | | | | |
| Parent Cert Exp Date | | | | | |
| Parent Matrix | H2O | | | | |
| Certified dpm/g At Ref Date | 3503.682716 | | | | |
| Certified dpm/g on 01/03/2013 13:25 | 2995.111607 | | | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. -BJS 3/22/10 | | | | |
| Parent Tech | Unknown | | | | |
| Is_Primary | FALSE | | | | |
| Is_LCS | TRUE | | | | |
| Is_Tracer | FALSE | | | | |
| Is_Calib | FALSE | | | | |

## H-3 Standard Verification

**Verifier's Name:** Brian Steffens **Date:** 1/6/2014

**Pipettor ID:** FJ40469
**Pipettor ID:** Auto-pipettor
**Pipettor ID:** na
**Standard ID:** S-0289
**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard |
|---|---|
| **S-0289-V1** | 5.019 g |
| **S-0289-V2** | 4.993 g |
| **S-0289-V3** | 4.996 g |
| **S-0289-V4** | 5.005 g |
| **S-0289-V5** | 4.993 g |
| | |
| | |
| | |
| | |
| | |

**Balance ID:** H1331122173560P

## H-3 Standard Verification

**Verifier's Name:** Brian Steffens **Date:** 7-6-14

**Pipettor ID:** FJ40469
**Pipettor ID:** Auto-pipettor
**Pipettor ID:** na
**Standard ID:** S-0289
**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard | |
|---|---|---|
| S-0289-V1 | 5.019 | g |
| S-0289-V2 | 4.993 | g |
| S-0289-V3 | 4.996 | g |
| S-0289-V4 | 5.005 | g |
| S-0289-V5 | 4.993 | g |
| | | |
| | | |
| | | |
| | | |
| | | |

**Balance ID:** H1331122173560P

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

### Planning

| | |
|---|---|
| Planning Comments | |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.884999595 |
| Appx vol ml of Parent Sol'n | 3.892005204 |
| Expected Addition for Analysis g | |

### Standards Preparation / Dilution

| | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 1-3-13 1325 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | |
| DPM Xferred on 01/03/2014 11:01 | |
| Diluent/matrix | |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.90 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | |
| Final Dilution Density (g/mL) | |
| Final Dilution Measured Mass g | |
| Comments | |
| Final Dilution dpm/g | |
| Final Dil New Ref Date/Time | 01/03/2014 11:01 |

## Parent Standard Data

| | | | | | |
|---|---|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | | | |
| Parent Solution # | S-0237 | | | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.800000D | | |
| Parent Reference Date | 03/22/2010 10:10 | | | | |
| Parent Certified Act | 3503.682716 | Certl Act/Vol Units | dpm | g | |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | | | |
| Parent Supplier | NIST SRM 4927F | | | | |
| Parent Date Recvd | 01/02/00 | | | | |
| Parent Received By | Unknown | | | | |
| Parent Cert Exp Date | | | | | |
| Parent Matrix | H2O | | | | |
| Certified dpm/g At Ref Date | 3503.682716 | | | | |
| Certified dpm/g on 01/03/2014 11:01 | 2831.403127 | | | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. BJS 3/22/10 | | | | |
| Parent Tech | Unknown | | | | |
| Is_Primary | FALSE | | | | |
| Is_LCS | TRUE | | | | |
| Is_Tracer | FALSE | | | | |
| Is_Calib | FALSE | | | | |

2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Folder Duplicate

# Report Compilation Checklist

**ARS SDG:** 14-02665 **Client Name:** LANL **Sample Matrix:** AQ

| LEVEL 1 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 1) Cover Page Complete and Accurate (see ARS-059)? | ✓Yes No N/A | |
| 2) Technical Review Checklist(s) Complete and Accurate? | ✓Yes No N/A | |
| 3) Case Narrative Complete and Accurate (see ARS-059)? | ✓Yes No N/A | |
| 4) Form 1s Present for all Samples and Tests? | ✓Yes No N/A | |
| 5) Client Specific Components are Present and Complete? | ✓Yes No N/A | |

| LEVEL 2 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 6) Batch Quality Control Report is Present and Accurate? | ✓Yes No N/A | |
| 7) DQO Report is Present and Accurate? | ✓Yes No N/A | |
| 8) Client Specific Batch QC Components are Present and Complete? | Yes No ✓N/A | |

| LEVEL 3 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 9) Efficiencies are Present? | ✓Yes No N/A | |
| 10) Calibrations are Present? | ✓Yes No N/A | |
| 11) Backgrounds are Present? | ✓Yes No N/A | |
| 12) Spectrum Analysis is Present? | ✓Yes No N/A | |
| 13) Spectral Plots are Present? | ✓Yes No N/A | |
| 14) Plateaus are Present? | ✓Yes No N/A | |
| 15) Control Charts are Present? | ✓Yes No N/A | |
| 16) Other: | Yes No ✓N/A | |

| LEVEL 4 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 17) Preparation Raw Data Present and Complete? | ✓Yes No N/A | |
| 18) Instrument Raw Data Present and Complete? | ✓Yes No N/A | |
| 19) Calibration Certificates Present? | ✓Yes No N/A | |
| 20) Copies of Log Book Pages Present? | ✓Yes No N/A | |
| 21) Sample Receiving Documentation Present? | ✓Yes No N/A | |
| 22) LIMS Reports Present? | ✓Yes No N/A | |
| 23) Applicable Correspondence Present? | ✓Yes No N/A | |
| 24) Other: | Yes No ✓N/A | |

| Report Generator Signature | Date | Management Review Signature | Date |
|---|---|---|---|
| [signature] | 11-18-14 | James D. [signature] | 11-18-14 |

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-02665

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

| | | | |
|---|---|---|---|
| **ARS A. Batch ID(s):** | **Batch A:** B14-02653 | **Batch B:** NA | **Batch C:** NA |
| **Test Method(s):** | LSC-A-022 | NA | NA |

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| **1) 100% of Manual Transcriptions Verified?** | Yes No N/A | Yes No N/A |
| **2) 100% of Manual Calculations Verified?** | Yes No N/A | Yes No N/A |
| **3) Blank Composition/Configuration Matches Calibration?** | Yes No N/A | Yes No N/A |
| **4) Deviations from procedure are documented and verified?** | Yes No N/A | Yes No N/A |
| **5) Appropriate Cocktail Selected?** | Yes No N/A | Yes No N/A |

**6) Sample Prep Anomaly?** ☑ **No** ☐ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

| | | | |
|---|---|---|---|
| Chemist Signature | Date 11-13-14 | Verifier Review Signature | Date 11-13-14 |

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| **1) Calibrations Valid and Current?** | Yes No N/A | Yes No N/A |
| **2) Backgrounds Valid and Current?** | Yes No N/A | Yes No N/A |
| **3) Source Checks Completed and Acceptable?** | Yes No N/A | Yes No N/A |

| | |
|---|---|
| QA Officer Signature | Date 11-18-14 |

| | Analyst Review | Technicial Review |
|---|---|---|
| **4) Background Checks Complete and Acceptable?** | Yes No N/A | Yes No N/A |
| **5) 100% of Manually Entered Parameters Verified Accurate?** | Yes No N/A | Yes No N/A |
| **6) Appropriate QC samples initiated at required frequency?** | Yes No N/A | Yes No N/A |
| **6) Test/Sample Specific Parameters** (See ARS-059 for details) | | |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

**7) Analysis Anomaly?** ☑ **No** ☐ **Yes** (See Comments) **NCR #** (If initiated): _____

| | | | |
|---|---|---|---|
| Analyst Signature | Date 11-17-14 | Technicial Reviewer Signature | Date 11-17-14 |

Batch A: B14-02653

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes ~~No~~ N/A | Yes (No) N/A |
| 2) RDL Criteria are Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 3) Method Blank Criterion Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 4) LCS/LCD Criteria Met? Only LCSD passed | ~~Yes~~ No N/A | (Yes) No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? not at 1s | Yes ~~No~~ N/A | Yes (No) N/A |
| 6) MS/MSD Criteria Met? | Yes No ~~N/A~~ | Yes No (N/A) |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

| Project Manager Signature | Date | QA Officer Signature | Date |
|---|---|---|---|
| SDL | 11-18-14 | James D. Lu | 11-18-14 |

## GENERAL COMMENTS

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-02665

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

**ARS A. Batch ID(s):** **Batch A:** B14-02345 **Batch B:** NA **Batch C:** NA

**Test Method(s):** LSC-A-022 NA NA

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| 1) 100% of Manual Transcriptions Verified? | Yes No N/A | Yes No N/A |
| 2) 100% of Manual Calculations Verified? | Yes No N/A | Yes No N/A |
| 3) Blank Composition/Configuration Matches Calibration? | Yes No N/A | Yes No N/A |
| 4) Deviations from procedure are documented and verified? | Yes No N/A | Yes No N/A |
| 5) Appropriate Cocktail Selected? | Yes No N/A | Yes No N/A |

N/A

11-17-1

6) Sample Prep Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

Chemist Signature: [signature] Date: 11-17-14

Verifier Review Signature: No verifier present Date:

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| 1) Calibrations Valid and Current? | Yes No N/A | Yes No N/A |
| 2) Backgrounds Valid and Current? | Yes No N/A | Yes No N/A |
| 3) Source Checks Completed and Acceptable? | Yes No N/A | Yes No N/A |

QA Officer Signature: James D. [signature] Date: 11-18-14

| | Analyst Review | Technicial Review |
|---|---|---|
| 4) Background Checks Complete and Acceptable? | Yes No N/A | Yes No N/A |
| 5) 100% of Manually Entered Parameters Verified Accurate? | Yes No N/A | Yes No N/A |
| 6) Appropriate QC samples initiated at required frequency? | Yes No N/A | Yes No N/A |
| 6) Test/Sample Specific Parameters (See ARS-059 for details) | | NA |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

7) Analysis Anomaly? ☑ No ☐ Yes (See Comments) NCR # (If initiated): _____

Analyst Signature: [signature] Date: 11-17-14

Technicial Reviewer Signature: NA Date:

Batch A: B14-02345

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes No ~~N/A~~ | Yes No N/A |
| 2) RDL Criteria are Met? | Yes No ~~N/A~~ | Yes No N/A |
| 3) Method Blank Criterion Met? | Yes No ~~N/A~~ | Yes No N/A |
| 4) LCS/LCD Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |
| 6) MS/MSD Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

| Project Manager Signature | Date | QA Officer Signature | Date |
|---|---|---|---|
| SOL | 11-18-14 | NA | |

## GENERAL COMMENTS

## Susan Leese

**From:** Susan Leese
**Sent:** Monday, October 20, 2014 4:14 PM
**To:** Keith Greene (kgreene@lanl.gov)
**Cc:** Patel, Nita
**Subject:** RN2015-4 Issue

Keith,
The low-level H3 sample associated with RN2015-4 was lost this weekend when its flask exploded. Nearly 500ml of sample remain in parent container- rerun started immediately.

Thanks,
*Susan*

**Susan Leese**
Project Manager
sleese@amrad.com

ARS INTERNATIONAL

ARS International, LLC
2609 North River Road
Port Allen, LA 70767-3469

225.381.2991 Office
225.381.2996 FAX
www.amrad.com

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American Radiation Services
Baton Rouge Laboratory

# DQO Report for SDG
ARS1-14-02665



| Analysis Code | Group | Isotope | Activity Units | Aliquot Units | ProcedureNo | RDL | LCS_LL | LCS_UL | MS_LL | MS_UL | RadY_LL | RadY_UL | GravY_LL | GravY_LL | RER | RPD | DiltionReq | RoughPrepReq | BlankCorrectionMDA | BlankCorrectionAll | CountTimeReq | AliquotRequired |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-021 | STD | H-3 | pCi | L | ARS-054 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | | |
| LSC-A-022 | STD | Enriched H-3 | pCi | L | ARS-040 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | | |

# SDG Report - Samples and Containers

SDG Specific Data

| | | | | | |
|---|---|---|---|---|---|
| SDG | ARS1-14-02665 | TAT Days | 28 | Project Type | Environmental |
| Sample Count | 1 Rpt Level 4 | Date Received | 10/2/2014 | COC Number | 2015-4 |
| Client | Los Alamos National Laboratory | Client Deadline | 10/30/2014 | PO Number | |
| Client Code | 114 | Internal Deadline | 10/29/2014 | Job Number | |
| Profile Number | PN-00094 | Lab Deadline | 10/27/2014 | Job Location | |
| Comments | | | | | |

Samples and Containers (➔) Checked In Thus Far

| FR | ClientID | Matrix | SampleStartDate | SampleEndDate | Disp | Hold | Arch | Storage | X | Units | Y | Units | Z | Units | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | CAWR-14-86942 | AQ | 09/29/14 10:21 AM | 09/29/14 10:21 AM | H | 90 | 5 | O5 | | | | | | | |
| ➔ | IC_ID | Cnt | Volume_mL | Wt_g | pH_Orig | pH_Final | CPM | uR_Hr | Storage | VOA | Head Sp | AF Units | AF Rate | AF Mins | AF Total Vol |
| | 176242 | 1 | 1000.00 | | | | 70 | 26 | | N | N/A | | | | |

# SDG Report - Analysis Assignments

| | | | |
|---|---|---|---|
| Temp SDG | ARS1-14-02665 | Sample Count | 1 |
| Client | Los Alamos National Laboratory | Analysis Count | 2-2 |

**Samples Count Totals per Analysis**

| Analysis Code | Analysis Description | Samples Count |
|---|---|---|
| LSC-A-021 | Low Level Tritium Screen in (Aqueous) | 1 |
| LSC-A-022 | Low Level Tritium by Enrichment Process in (Aqueous [AQ]) | 1 |

**Analyses Assigned Per Fraction**

| Fraction | Analysis Code | X = Assigned |
|---|---|---|
| 001 | LSC-A-021 | X |
| 001 | LSC-A-022 | X |

# ARS FILE TRACKING SHEET

**SDG:** ARS1-14-02665

| Task | Date / Time | Initials |
|---|---|---|
| Date & Time Samples Received | 10-02-14 12:38 | JRN |
| ICOC Initiated/Storage Location: O5 | 10-02-14 13:15 | JRN |
| Technical Checks Performed | See Batch | |
| Report Written / EDD Generated 11-17-14 1611 SDL | 11-18-14 909 | SDL |
| Quality Assurance Checks Performed on Report | 11-18-14 1025 | JDT |
| Management Checks Performed on Report | | |
| *Preliminary Report Scan* | | |
| Report E-mailed/Faxed | | |
| Invoice Completed Invoice #:_____ | | |
| Requires Report Mailed Yes / ~~No~~ | | |
| Requires Original COC mailed Yes / ~~No~~ | | |
| Report Reviewed and Imaged | | |

EDD Loaded 11-17-14 SDL

**SPECIAL REQUIREMENTS**

| Requirement | Yes | No |
|---|---|---|
| 3 Hour Rush | ☐ | ☑ |
| 24 Hour Rush | ☐ | ☑ |
| 48 Hour Rush | ☐ | ☑ |
| 3 Day Rush | ☐ | ☑ |
| 5 Day Rush | ☐ | ☑ |
| 10 Day Rush | ☐ | ☑ |
| Standard Oil/Gas Client (5 Day) | ☐ | ☑ |
| Standard Turnaround | ☑ | ☐ |

**NOTES** Original sample lost in explosion 10-20-14 SDL
Keith/Rita emailed - See folder Duplicate

ARS-062-005 r6

**COMPANY NAME:** LANL **SDG:** ARSI-14-02665

**SHIPPING CONTAINER**

| | | |
|---|---|---|
| Good Condition | ☑ Yes | ☐ No |
| Radioactive | ☐ Yes | ☑ No |
| UN2910 | ☐ Yes | ☑ No |
| Sec. Seals | ☐ Yes | ☑ No |
| Seals Intact | ☐ Yes ☐ No | ☑ N/A |
| Air Bill | ☐ Yes | ☑ No |

**COC PRESENT WITH SAMPLES**

| | | |
|---|---|---|
| COC | ☑ Yes | ☐ No |

**SAMPLE CONTAINER(S)**

| | | |
|---|---|---|
| Good Condition | ☑ Yes | ☐ No |
| Sec. Seals | ☐ Yes | ☑ No |
| Seal Intact | ☐ Yes ☐ No | ☑ N/A |
| Marked Radioactive | ☐ Yes | ☑ No |

# Samples Rcv 1

Matrix [ AF , AQ , BI , FE , LT , SI , SO , UR , VG ]

**External and Internal Surveys**

| | | | | | |
|---|---|---|---|---|---|
| Exposure Rate Meter | M3 242861 | Serial No.: | PR 264266 | Calibration Due Date: | 4/16/15 |
| Count Rate Meter | M2 154859 | Serial No.: | PR 184559 | Calibration Due Date: | 4/16/15 |

| | | | | |
|---|---|---|---|---|
| Background Exposure Rate (µR/hr) | 24 | Max Exposure Rate on Shipping Containers Externals (Plus Bkgd) | 26 | µR/hr |
| Background Count Rate (cpm) | 60 | Max Removable Count Rate on Shipping Containers Externals (Plus Bkgd) | 70 | cpm |
| | | Max Removable Count Rate on Shipping Containers Internals (Plus Bkgd) | 70 | cpm |

| Sample Label/Comments/Notes | pH Orig | pH Final | Mark if Preserve | Acid Lot # | Weight(g) / Volume(mL) | µR/hr | cpm |
|---|---|---|---|---|---|---|---|
| | pH ≤ 2 is Acceptable | | | | | Acceptance Limits <500 µR/hr | <100 cpm/cm² |
| CAWR-14-86942 | | | ☐ | | 1000 | 26 | 70 |
| | | | ☐ | 10-2-14 JRN | | | |
| | | | ☐ | | | | |
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| | | | ☐ | | | | |

Surveyors' Name: [signature] Date/Time Surveyed: 10-2-14 1238

S:\Procedures_Controlled\Controlled Forms\ARS-062 Sample Receipt Inspection Form

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ACP

COC/Lab Request #: 2015-4



**Client Contact:**

**Lab Agreement # :** 63641-001-10

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-86942 | Sep 29 2014 | 10:21 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martyn | 10/1/14 3:00 | | Ryan Newman | 10-2-14 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

1238

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-40



**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8011-TB | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8151A-PCP | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86935 | Oct 6 2014 | 09:40 | W | 1 | 2 | | | 2 | | 2 | | | 1 | | 1 | 2 | | 1 | 1 | | | | |
| CAWR-14-86962 | Oct 6 2014 | 09:40 | W | | | | | | | | | 1 | | 1 | | | 1 | | | | | | |
| CAWR-14-86912 | Oct 6 2014 | 09:40 | W | | | 1 | | 2 | | | | | | | | | | | | | | | |
| CAWR-14-86939 | Oct 6 2014 | 10:55 | W | 1 | 2 | | 3 | 2 | 2 | 2 | | | 1 | | 1 | 2 | | 1 | 1 | | | | |
| CAWR-14-86966 | Oct 6 2014 | 10:55 | W | | | | | | | | | 1 | | 1 | | | 1 | | | | | | |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 1 | 2 | | 3 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | | | | |
| CAWR-14-86875 | Oct 6 2014 | 10:55 | W | | 2 | | 3 | 2 | 2 | 2 | | | | | | 2 | | | | | | | |
| CAWR-14-86880 | Oct 6 2014 | 10:55 | W | 1 | 2 | | 3 | 2 | 2 | 2 | | | 1 | | 1 | 2 | | 1 | 1 | | | | |
| CAWR-14-86884 | Oct 6 2014 | 10:55 | W | | | | | | | | | 1 | | 1 | | | 1 | | | | | | |
| CAWR-14-86910 | Oct 6 2014 | 10:55 | W | | | 1 | | 2 | | | | | | | | | | | | | | | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martinez | 10/7/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1235 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | PEB | |
| TOP DEPTH: | | | SAMPLE USAGE: | QC | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | ~~WSP-8011-TB~~ | ~~40 ML SEPTUM GLASS~~ | ~~1~~ | ~~HCL~~ DF 10/6/14 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | | |
| | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-CN(T) | 250 ML POLY | 1 | NAOH | Y | NA |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE AT 8/3/14 | | |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | ~~WSP-LL-8260B-TB~~ | ~~40 ML SEPTUM GLASS~~ | 1 | ICE OF 10/6/14 | | |
| NA | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | Y | NA |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | Y | NA |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Shaw

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86875

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/08/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FB | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | QC | ↓ |
| BOTTOM DEPTH: | | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | Y | NA |
| ↓ | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~6~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8290-D/F | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8310-PAH | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86875

**WORK ORDER:**

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Stone + A. Stocker

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** Andrew Stocker | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** A. Martin | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86880

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | FD | |
| TOP DEPTH: | | | SAMPLE USAGE: | QC | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | ~~3~~ ~~2~~ 1 | HCL DF 10/3/14 | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86880 **WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

JS 10/6/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Stead

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Robert Stacker | 10/6/14 1305 | | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86884 **WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | F | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FD | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | QC | ↓ |
| BOTTOM DEPTH: | | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | MS |
| ↓ | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:** AS 10/6/14

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Shaw + D. Fellenz

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Shaw | 10/6/14 1305 | M. Martin | 10/6/14 1305 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86910 **WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | QC |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FTB | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | QC | ↓ |
| BOTTOM DEPTH: | | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | NA |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | ~~2~~ 1 | HCL DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ HCL | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:** JS 10/6/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Stocker

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Aulgay Stocker | 10/6/14 1305 | [illegible] | 10/6/14 1305 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
| | | | |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86912 **WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 0940 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | OK |
| LOCATION ID: | La Mesita Spring | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FTB | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | QC | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MB | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | MB |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL AT 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ HCL AT 10/3/14 | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/6/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Stow

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stowe | 10/6/14 1305 | Martin | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86935

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 10/06/2014 | **FIELD MATRIX:** | WG | GK |
| **TIME COLLECTED (HH:MM):** | | 0940 | **MEDIA:** | UA | ↓ |
| **PRS ID:** | | ok | **SAMPLE TECH CODE:** | UA | PP |
| **LOCATION ID:** | La Mesita Spring | ↓ | **FIELD PREP:** | UF | ok |
| **LOCATION TYPE:** | SPR | ↓ | **FIELD QC TYPE:** | REG | ↓ |
| **PORT:** | | ↓ | **SAMPLE USAGE:** | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| ↓ | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | ↓ | ↓ |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86935

**WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-RAD | 1 GAL POLY | 1 | HNO3 | Y | NA |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.13 mg/L Flow (in gpm) 0.4 GPM Oxidation-Reduction Potential NA mV

pH 7.89 SU Specific Conductance 316 uS/cm Temperature 17.80 deg C

Turbidity 5.1 NTU

**COLLECTED BY (PRINT)** W. Shaw + D. Fellenz

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** Andrew Stocker | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86939

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | WS | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | RC |
| LOCATION ID: | Rio Grande at Otowi Bridge | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | WCS | | FIELD QC TYPE: | REG | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | INV | ↓ |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| ↓ | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ↓ | ↓ |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | 3 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86939

**WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.75 mg/L Flow (in gpm) 291,740 GPM Oxidation-Reduction Potential NA mV

pH 8.27 SU Specific Conductance 325 uS/cm Temperature 13.80 deg C

Turbidity 79.8 NTU

**COLLECTED BY (PRINT)** W. Stan

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stacker | 10/6/14 1305 | M. Martin | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86962

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 0940 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | La Mesita Spring | ↓ | FIELD PREP: | F | ok |
| LOCATION TYPE: | SPR | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | NA |
| ↓ | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:** AS 10/6/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Shaw + D. Fellenz

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stocker | 10/6/14 1305 | [illegible] | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86966

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | WS | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | F | ok |
| LOCATION TYPE: | WCS | ↓ | FIELD QC TYPE: | REG | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | INV | ↓ |
| BOTTOM DEPTH: | | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | NA |
| ↓ | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:** JS 10/6/14

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Stow

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stoker | 10/6/14 1305 | W. Martin | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 09/16/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-40

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 358468 | EPA:120.1 | 2 | 1 | | | |
| 358468 | EPA:150.1 | 2 | 1 | | | |
| 358468 | EPA:160.1 | 2 | 1 | | | |
| 358468 | EPA:245.2 | 4 | 2 | | | |
| 358468 | EPA:300.0 | 2 | 1 | | | |
| 358468 | EPA:310.1 | 2 | 1 | | | |
| 358468 | EPA:335.4 | 2 | 1 | | | |
| 358468 | EPA:350.1 | 2 | 1 | | | |
| 358468 | EPA:351.2 | 2 | 1 | | | |
| 358468 | EPA:353.2 | 2 | 1 | | | |
| 358468 | EPA:365.4 | 2 | 1 | | | |
| 358468 | EPA:900 | 2 | 1 | | | |
| 358468 | EPA:901.1 | 2 | 1 | | | |
| 358468 | EPA:905.0 | 2 | 1 | | | |
| 358468 | HASL-300:AM-241 | 2 | 1 | | | |
| 358468 | HASL-300:ISOPU | 2 | 1 | | | |
| 358468 | HASL-300:ISOU | 2 | 1 | | | |
| 358468 | SM:A2340B | 2 | 1 | | | |
| 358468 | SW-846:6010C | 2 | 1 | | | |
| 358468 | SW-846:6020 | 2 | 1 | | | |
| 358468 | SW-846:6850 | 2 | 1 | | | |
| 358468 | SW-846:8011 | 2 | 1 | 2 | 1 | |
| 358468 | SW-846:8082 | 1 | 1 | | 1 | |
| 358468 | SW-846:8151A | 2 | 1 | | 1 | |
| 358468 | SW-846:8260B | 2 | 1 | 2 | 1 | |
| 358468 | SW-846:8270D | 1 | 1 | | 1 | |
| 358468 | SW-846:8310 | 2 | 1 | | 1 | |
| 358468 | SW-846:8321A_MOD | | | | | |
| 358468 | SW-846:9060 | 2 | 1 | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 358468 | EPA:120.1 | 1426404 | 1426404 | 2 | 1 | | | | | | | | | 1 | | | | 2 | | | |
| 358468 | EPA:150.1 | 1427923 | 1427923 | 2 | 1 | | | | | | | | | 1 | | | | 1 | | | |
| 358468 | EPA:160.1 | 1425713 | 1425713 | 2 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 358468 | EPA:245.2 | 1426297 | 1426296 | 4 | 2 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | EPA:300.0 | 1426694 | 1426694 | 2 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 358468 | EPA:310.1 | 1427930 | 1427930 | 2 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | EPA:335.4 | 1425872 | 1425871 | 2 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | EPA:350.1 | 1425369 | 1425368 | 2 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | EPA:351.2 | 1425371 | 1425370 | 2 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | EPA:353.2 | 1425672 | 1425672 | 2 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 358468 | EPA:365.4 | 1425671 | 1425670 | 2 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | EPA:900 | 1429454 | 1429454 | 2 | 1 | | | | 1 | 1 | 1 | | | 1 | | | | 1 | | | |
| 358468 | EPA:901.1 | 1425983 | 1425983 | 2 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 358468 | EPA:905.0 | 1427989 | 1427989 | 2 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | HASL-300:AM-241 | 1425702 | 1425702 | 2 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 358468 | HASL-300:ISOPU | 1425703 | 1425703 | 2 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 358468 | HASL-300:ISOU | 1425705 | 1425705 | 2 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 358468 | SM:A2340B | 1433098 | 1433098 | 2 | 1 | | | | | | | | | | | | | | | | |
| 358468 | SW-846:6010C | 1425927 | 1425926 | 2 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | SW-846:6020 | 1426078 | 1425905 | 2 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 358468 | SW-846:6850 | 1428696 | 1428695 | 2 | 1 | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 358468 | SW-846:8011 | 1427216 | 1427215 | 2 | 1 | 2 | 1 | | 1 | | | | | 1 | 1 | | | | | | |
| 358468 | SW-846:8082 | 1427900 | 1427897 | | 1 | | 1 | | 1 | | | | | 1 | 1 | | | | | | |
| 358468 | SW-846:8082 | 1431092 | 1431090 | 1 | | | | | 1 | | | | | 1 | | | | | | | |
| 358468 | SW-846:8151A | 1426585 | 1426584 | 2 | 1 | | 1 | | 1 | 1 | | | | 1 | 1 | | | | | | |
| 358468 | SW-846:8260B | 1429788 | 1429788 | 2 | 1 | 2 | 1 | | 1 | | | | | 2 | | | | | | | |
| 358468 | SW-846:8270D | 1425972 | 1425971 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 358468 | SW-846:8310 | 1427006 | 1427003 | 2 | 1 | | 1 | | 1 | 1 | | | | 1 | 1 | | | | | | |
| 358468 | SW-846:8321A_MOD | 1425807 | 1425803 | | | | | | 1 | | | | | 1 | 1 | | | | | | |
| 358468 | SW-846:9060 | 1425832 | 1425832 | 2 | 1 | | | | 1 | | | | | 1 | | | | 2 | | | |

# DATA VALIDATION REPORT

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-86961 | 1203185287 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-86966 | 1203185288 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203185286 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-86977 | 1203189000 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203188998 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203183648 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203183647 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203183646 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86880 | 358468029 | FD | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86935 | 1203185027 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86935 | 1203185028 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86935 | 358468003 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86939 | 358468012 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203185026 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203185025 | MB | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-86884 | 358468030 | FD | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203185918 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-86962 | 358468005 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-86966 | 358468013 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203185917 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203185916 | MB | 4 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-86884 | 358468030 | FD | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203189015 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203189019 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 358468005 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-86966 | 358468013 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203189010 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203189008 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86880 | 358468029 | FD | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86935 | 1203184009 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86935 | 1203184012 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86935 | 358468003 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-86939 | 358468012 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203184007 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203184006 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203182737 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203182738 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203182736 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203182735 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86880 | 358468029 | FD | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86935 | 1203182741 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86935 | 1203182742 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86935 | 358468003 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-86939 | 358468012 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203182740 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203182739 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203183541 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203183540 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203183539 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203183537 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86962 | 1203183538 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203183534 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203183533 | MB | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | CAWR-14-86874 | 358468019 | PEB | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAWR-14-86880 | 358468029 | FD | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAWR-14-86935 | 358468003 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAWR-14-86939 | 358468012 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | LCS | 1203192667 | LCS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | MB | 1203192663 | MB | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | WST14-14-86623 | 1203192664 | DUP | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | WST14-14-86623 | 1203192665 | MS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | WST14-14-86623 | 1203192666 | MSD | 0 | 0 | 2 | 0 |
| EPA:901.1 | RAD | CAWR-14-86874 | 358468019 | PEB | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-86880 | 358468029 | FD | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-86935 | 1203184293 | DUP | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-86935 | 358468003 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-86939 | 358468012 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | LCS | 1203184294 | LCS | 0 | 0 | 3 | 0 |
| EPA:901.1 | RAD | MB | 1203184292 | MB | 5 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAWR-14-86880 | 358468029 | FD | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAWR-14-86935 | 1203189175 | DUP | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAWR-14-86935 | 1203189176 | MS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | CAWR-14-86935 | 358468003 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAWR-14-86939 | 358468012 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | LCS | 1203189177 | LCS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | MB | 1203189174 | MB | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-86874 | 1203183621 | DUP | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-86880 | 358468029 | FD | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-86935 | 358468003 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-86939 | 358468012 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | LCS | 1203183622 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:AM-241 | RAD | MB | 1203183620 | MB | 1 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-86874 | 1203183624 | DUP | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-86874 | 358468019 | PEB | 2 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| HASL-300:ISOPU | RAD | CAWR-14-86880 | 358468029 | FD | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-86935 | 358468003 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-86939 | 358468012 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | LCS | 1203183625 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOPU | RAD | MB | 1203183623 | MB | 2 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-86874 | 1203183627 | DUP | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-86874 | 358468019 | PEB | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-86880 | 358468029 | FD | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-86935 | 358468003 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-86939 | 358468012 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | LCS | 1203183628 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOU | RAD | MB | 1203183626 | MB | 3 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86874 | 358468019 | PEB | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86884 | 358468030 | FD | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86962 | 1203184133 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86962 | 1203184134 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86962 | 358468005 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-86966 | 358468013 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203184132 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203184131 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86874 | 358468019 | PEB | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86884 | 358468030 | FD | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86962 | 1203184623 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86962 | 1203184624 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86962 | 358468005 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-86966 | 358468013 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203184082 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203184081 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-87142 | 1203190771 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-14-87142 | 1203190772 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-86884 | 358468030 | FD | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-86962 | 358468005 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-86966 | 358468013 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203190770 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203190769 | MB | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8011 | VOC | CAWR-14-86874 | 358468014 | PEB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86875 | 358468020 | FB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86880 | 358468025 | FD | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86910 | 358468031 | FTB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86912 | 358468006 | FTB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86935 | 358468001 | REG | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-86939 | 358468008 | REG | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | LCS | 1203187227 | LCS | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | LCSD | 1203187228 | LCSD | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | MB | 1203187226 | MB | 2 | 1 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-86874 | 358468017 | PEB | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-86875 | 358468023 | FB | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-86880 | 358468028 | FD | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-86939 | 358468011 | REG | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | LCS | 1203188920 | LCS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | LCS | 1203196958 | LCS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | LCSD | 1203192294 | LCSD | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | MB | 1203188919 | MB | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | MB | 1203196957 | MB | 8 | 2 | 0 | 0 |
| SW-846:8151A | HERB | CAWR-14-86874 | 358468016 | PEB | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | CAWR-14-86875 | 358468022 | FB | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | CAWR-14-86880 | 358468027 | FD | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | CAWR-14-86935 | 358468004 | REG | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | CAWR-14-86939 | 358468010 | REG | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | LCS | 1203185725 | LCS | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | LCSD | 1203185731 | LCSD | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | MB | 1203185724 | MB | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | WST14-14-86623 | 1203185726 | MS | 0 | 1 | 1 | 0 |
| SW-846:8260B | VOC | CAWR-14-86874 | 358468019 | PEB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86875 | 358468024 | FB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86880 | 358468029 | FD | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86910 | 358468032 | FTB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86912 | 358468007 | FTB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86935 | 358468003 | REG | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86939 | 358468012 | REG | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | LCS | 1203193526 | LCS | 0 | 3 | 68 | 0 |
| SW-846:8260B | VOC | LCS | 1203193527 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203193525 | MB | 78 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86874 | 358468019 | PEB | 61 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86875 | 358468024 | FB | 61 | 6 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8270D | SVOC | CAWR-14-86880 | 358468029 | FD | 61 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86939 | 1203184273 | MS | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86939 | 1203184274 | MSD | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86939 | 358468012 | REG | 61 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | LCS | 1203184272 | LCS | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | MB | 1203184271 | MB | 61 | 6 | 0 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86874 | 358468015 | PEB | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86875 | 358468021 | FB | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86880 | 358468026 | FD | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86935 | 1203186656 | MS | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86935 | 358468002 | REG | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | CAWR-14-86939 | 358468009 | REG | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | LCS | 1203186655 | LCS | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | LCSD | 1203186672 | LCSD | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | MB | 1203186654 | MB | 18 | 1 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | CAWR-14-86874 | 358468018 | PEB | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | LCS | 1203183858 | LCS | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | LCSD | 1203183859 | LCSD | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | MB | 1203183857 | MB | 20 | 2 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-86874 | 358468019 | PEB | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-86880 | 358468029 | FD | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-86932 | 1203183928 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-86935 | 1203183927 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-86935 | 358468003 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-86939 | 358468012 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203183926 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203183925 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

# DATA VALIDATION REPORT

| Field Sample ID | Lab Sample ID | Analytical Method | Sample Date | Extraction Date | Analysis Date | Extraction Hold Time | Max Extract Hold Time | Reject Above | Exceeds Limit | Analysis Hold Time | Max Analysis Hold Time | Reject Above | Exceeds Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86874 | 358468019 | SW-846:8260B | 10-06-2014 | | 10-22-2014 | NA | | | | 16 | 14 | 28 | X |
| CAWR-14-86875 | 358468024 | SW-846:8260B | 10-06-2014 | | 10-22-2014 | NA | | | | 16 | 14 | 28 | X |
| CAWR-14-86880 | 358468029 | SW-846:8260B | 10-06-2014 | | 10-22-2014 | NA | | | | 16 | 14 | 28 | X |
| CAWR-14-86910 | 358468032 | SW-846:8260B | 10-06-2014 | | 10-22-2014 | NA | | | | 16 | 14 | 28 | X |
| CAWR-14-86912 | 358468007 | SW-846:8260B | 10-06-2014 | | 10-22-2014 | NA | | | | 16 | 14 | 28 | X |
| CAWR-14-86935 | 358468003 | SW-846:8260B | 10-06-2014 | | 10-22-2014 | NA | | | | 16 | 14 | 28 | X |
| CAWR-14-86939 | 358468012 | SW-846:8260B | 10-06-2014 | | 10-22-2014 | NA | | | | 16 | 14 | 28 | X |
| CAWR-14-86874 | 358468015 | SW-846:8310 | 10-06-2014 | 10-13-2014 | 10-16-2014 | 7 | 7 | 14 | X | 3 | 40 | 40 | |
| CAWR-14-86875 | 358468021 | SW-846:8310 | 10-06-2014 | 10-13-2014 | 10-16-2014 | 7 | 7 | 14 | X | 3 | 40 | 40 | |
| CAWR-14-86880 | 358468026 | SW-846:8310 | 10-06-2014 | 10-13-2014 | 10-16-2014 | 7 | 7 | 14 | X | 3 | 40 | 40 | |
| CAWR-14-86935 | 358468002 | SW-846:8310 | 10-06-2014 | 10-13-2014 | 10-16-2014 | 7 | 7 | 14 | X | 3 | 40 | 40 | |
| CAWR-14-86939 | 358468009 | SW-846:8310 | 10-06-2014 | 10-13-2014 | 10-16-2014 | 7 | 7 | 14 | X | 3 | 40 | 40 | |

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203183533 | METHOD BLANK | EPA:365.4 | W | Total Phosphate as Phosphorus | 0.0343 | J | mg/L | 0.050 |
| MB | 1203184081 | METHOD BLANK | SW-846:6020 | W | Arsenic | 1.85 | J | ug/L | 5.00 |

# DATA VALIDATION REPORT

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86962 | 1203183533 | METHOD BLANK | EPA:365.4 | Total Phosphate as Phosphorus | 0.0343 | mg/L | 0.0712 | | 0.050 | Y | 5 | 100 | Y |
| CAWR-14-86966 | 1203183533 | METHOD BLANK | EPA:365.4 | Total Phosphate as Phosphorus | 0.0343 | mg/L | 0.0417 | J | 0.050 | Y | 5 | 100 | Y |
| CAWR-14-86874 | 1203183533 | METHOD BLANK | EPA:365.4 | Total Phosphate as Phosphorus | 0.0343 | mg/L | 0.0297 | J | 0.050 | Y | 5 | 100 | Y |
| CAWR-14-86884 | 1203183533 | METHOD BLANK | EPA:365.4 | Total Phosphate as Phosphorus | 0.0343 | mg/L | 0.0217 | J | 0.050 | Y | 5 | 100 | Y |
| CAWR-14-86966 | 1203184081 | METHOD BLANK | SW-846:6020 | Arsenic | 1.85 | ug/L | 3.56 | J | 5.00 | Y | 5 | 100 | Y |
| CAWR-14-86874 | 1203184081 | METHOD BLANK | SW-846:6020 | Arsenic | 1.85 | ug/L | 1.72 | J | 5.00 | Y | 5 | 100 | Y |
| CAWR-14-86884 | 1203184081 | METHOD BLANK | SW-846:6020 | Arsenic | 1.85 | ug/L | 3.3 | J | 5.00 | Y | 5 | 100 | Y |

6. Any surrogate recoveries outside the control limits?

| Field Sample ID | Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Spike Recovery | Upper Limit | Lower Limit | Rejection Limit |
|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86912 | 358468006 | SW-846:8011 | Bromofluorobenzene[4-] | 1427216 | 10-15-2014 | 348 | 145 | 56 | 10 |
| CAWR-14-86939 | 358468012 | SW-846:8270D | Tribromophenol[2,4,6-] | 1425972 | 10-12-2014 | 13 | 126 | 33 | |

7. Any MS/MSD recoveries or RPDs outside the control limits?

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86935 | 1203182742 | | EPA:351.2 | Total Kjeldahl Nitrogen | 1425370 | 10-14-2014 | W | 114 | | 110 | 90 | 10 | | |
| CAWR-14-86935 | 1203182742 | | EPA:351.2 | Total Kjeldahl Nitrogen | 1425370 | 10-14-2014 | W | 114 | | 110 | 90 | 10 | | |
| CAWR-14-86939 | 1203184273 | 1203184274 | SW-846:8270D | Benzidine | 1425971 | 10-12-2014 | W | 14 | 5 | 127 | 10 | | 93 | 30 |
| CAWR-14-86939 | 1203184273 | 1203184274 | SW-846:8270D | Pyridine | 1425971 | 10-12-2014 | W | 67 | 46 | 112 | 20 | | 38 | 30 |

# DATA VALIDATION REPORT

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203183858 | 1203183859 | SW-846:8321A_MOD | Tetryl | 1425803 | 10-30-2014 | W | 22 | 25 | 117 | 62 | | 10 | 12 | 19 |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

| Field Sample ID | Lab Sample ID | LD Lab Sample ID | Analytical Method | Parameter Name | Sample Matrix | Lab Result | LD Lab Result | Lab Units | Detect Flag | LD Detect Flag | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86962 | 358468005 | 1203183648 | EPA:160.1 | Total Dissolved | W | 214 | 177 | mg/L | Y | Y | 19 | 10 |

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | .00435 | pCi/L | .00435 | pCi/L | 0.0275 | 0.00615 | W | 10/06/2014 | | 1425702 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | INORGANIC | SW-846:6020 | Arsenic | J | U | I4 | N | 1.72 | ug/L | 1.72 | ug/L | | | W | 10/06/2014 | | 1426078 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | 2.18 | pCi/L | 2.18 | pCi/L | 5.50 | 1.43 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | .458 | pCi/L | .458 | pCi/L | 5.00 | 1.44 | W | 10/06/2014 | | 1425983 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | -1.12 | pCi/L | -1.12 | pCi/L | 2.73 | 0.504 | W | 10/06/2014 | | 1429454 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | EPA:900 | Gross beta | U | U | R5 | N | -.544 | pCi/L | -.544 | pCi/L | 2.88 | 0.716 | W | 10/06/2014 | | 1429454 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | .792 | pCi/L | .792 | pCi/L | 9.63 | 2.77 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | .00271 | pCi/L | .00271 | pCi/L | 0.0403 | 0.00718 | W | 10/06/2014 | | 1425703 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -.00814 | pCi/L | -.00814 | pCi/L | 0.0356 | 0.00718 | W | 10/06/2014 | | 1425703 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | .44 | pCi/L | .44 | pCi/L | 58.1 | 13.9 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | .0436 | pCi/L | .0436 | pCi/L | 4.61 | 1.19 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | -.121 | pCi/L | -.121 | pCi/L | 0.482 | 0.128 | W | 10/06/2014 | | 1427989 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Tetryl | U | UJ | HE12a | N | 0.526 | ug/L | 0.526 | ug/L | | | W | 10/06/2014 | | 1425807 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | J | U | I4 | N | 0.0297 | mg/L | 0.0297 | mg/L | | | W | 10/06/2014 | | 1425671 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | HASL-300:ISOU | Uranium-234 | U | U | R5 | N | .00835 | pCi/L | .00835 | pCi/L | 0.0701 | 0.00835 | W | 10/06/2014 | | 1425705 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | HASL-300:ISOU | Uranium-235/236 | U | U | R5 | N | -.00344 | pCi/L | -.00344 | pCi/L | 0.0491 | 0.00769 | W | 10/06/2014 | | 1425705 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86874 | PEB | INIT | RAD | HASL-300:ISOU | Uranium-238 | U | U | R5 | N | .0139 | pCi/L | .0139 | pCi/L | 0.0373 | 0.00835 | W | 10/06/2014 | | 1425705 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | -.00422 | pCi/L | -.00422 | pCi/L | 0.0267 | 0.00517 | W | 10/06/2014 | | 1425702 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | -1.11 | pCi/L | -1.11 | pCi/L | 5.11 | 1.45 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | 1.65 | pCi/L | 1.65 | pCi/L | 5.97 | 1.35 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | -3.84 | pCi/L | -3.84 | pCi/L | 9.96 | 3.02 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | -.00588 | pCi/L | -.00588 | pCi/L | 0.0437 | 0.00831 | W | 10/06/2014 | | 1425703 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | .00882 | pCi/L | .00882 | pCi/L | 0.0386 | 0.00882 | W | 10/06/2014 | | 1425703 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | 48 | pCi/L | 48 | pCi/L | 77.3 | 16.4 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | -.704 | pCi/L | -.704 | pCi/L | 5.88 | 1.58 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86880 | FD | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | .0751 | pCi/L | .0751 | pCi/L | 0.479 | 0.138 | W | 10/06/2014 | | 1427989 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86884 | FD | INIT | INORGANIC | SW-846:6020 | Arsenic | J | U | I4 | N | 3.3 | ug/L | 3.3 | ug/L | | | W | 10/06/2014 | | 1426078 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86884 | FD | INIT | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | J | U | I4 | N | 0.0217 | mg/L | 0.0217 | mg/L | | | W | 10/06/2014 | | 1425671 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | .00783 | pCi/L | .00783 | pCi/L | 0.0331 | 0.00691 | W | 10/06/2014 | | 1425702 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | -1.32 | pCi/L | -1.32 | pCi/L | 5.72 | 1.66 | W | 10/06/2014 | | 1425983 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | -2.25 | pCi/L | -2.25 | pCi/L | 5.74 | 1.74 | W | 10/06/2014 | | 1425983 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | 1.82 | pCi/L | 1.82 | pCi/L | 11.8 | 3.28 | W | 10/06/2014 | | 1425983 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | .00294 | pCi/L | .00294 | pCi/L | 0.0437 | 0.00657 | W | 10/06/2014 | | 1425703 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -.00294 | pCi/L | -.00294 | pCi/L | 0.0386 | 0.00657 | W | 10/06/2014 | | 1425703 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | UI | R | R5a | N | 32.8 | pCi/L | 32.8 | pCi/L | 32.1 | 21.4 | W | 10/06/2014 | | 1425983 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | -1.63 | pCi/L | -1.63 | pCi/L | 5.92 | 1.72 | W | 10/06/2014 | | 1425983 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | -.205 | pCi/L | -.205 | pCi/L | 0.487 | 0.129 | W | 10/06/2014 | | 1427989 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86935 | REG | INIT | GENERAL CHEMISTRY | EPA:351.2 | Total Kjeldahl Nitrogen | | J+ | I6b | Y | 0.266 | mg/L | 0.266 | mg/L | | | W | 10/06/2014 | | 1425371 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | .00497 | pCi/L | .00497 | pCi/L | 0.0315 | 0.00609 | W | 10/06/2014 | | 1425702 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Aniline | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Atrazine | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Azobenzene | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Benzidine | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Benzoic Acid | U | UJ | SV3a | N | 20.0 | ug/L | 20.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Benzyl Alcohol | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Bis(2-chloroethoxy)methane | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Bis(2-chloroethyl)ether | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Bis(2-ethylhexyl)phthalate | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Bromophenyl-phenylether[4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Butylbenzylphthalate | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | .465 | pCi/L | .465 | pCi/L | 6.90 | 1.98 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Chloro-3-methylphenol[4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Chloroaniline[4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Chloronaphthalene[2-] | U | UJ | SV3a | N | 1.00 | ug/L | 1.00 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Chlorophenol[2-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Chlorophenyl-phenyl[4-] Ether | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | .0605 | pCi/L | .0605 | pCi/L | 7.00 | 1.74 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Di-n-butylphthalate | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Di-n-octylphthalate | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dibenzofuran | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dichlorobenzene[1,2-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dichlorobenzene[1,3-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dichlorobenzene[1,4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dichlorobenzidine[3,3'-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dichlorophenol[2,4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Diethylphthalate | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dimethyl Phthalate | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dimethylphenol[2,4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dinitro-2-methylphenol[4,6-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dinitrophenol[2,4-] | U | UJ | SV3a | N | 20.0 | ug/L | 20.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dinitrotoluene[2,4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dinitrotoluene[2,6-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dinoseb | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dioxane[1,4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Diphenylamine | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Hexachlorobenzene | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Hexachlorobutadiene | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Hexachlorocyclopentadiene | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Hexachloroethane | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Isophorone | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Methylphenol[2-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Methylphenol[4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | 3.31 | pCi/L | 3.31 | pCi/L | 10.9 | 2.79 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitroaniline[2-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitroaniline[3-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitroaniline[4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitrobenzene | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitrophenol[2-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitrophenol[4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitroso-di-n-butylamine[N-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitroso-di-n-propylamine[N-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitrosodiethylamine[N-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitrosodimethylamine[N-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Nitrosopyrrolidine[N-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Oxybis(1-chloropropane)[2,2'-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Pentachlorobenzene | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Phenol | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | 0 | pCi/L | 0 | pCi/L | 0.040 | 0.0108 | W | 10/06/2014 | | 1425703 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -.0215 | pCi/L | -.0215 | pCi/L | 0.0353 | 0.017 | W | 10/06/2014 | | 1425703 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | -32.2 | pCi/L | -32.2 | pCi/L | 74.2 | 21.3 | W | 10/06/2014 | | 1425983 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Pyridine | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | -1.67 | pCi/L | -1.67 | pCi/L | 6.59 | 1.82 | W | 10/06/2014 | | 1425983 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | -.289 | pCi/L | -.289 | pCi/L | 0.486 | 0.126 | W | 10/06/2014 | | 1427989 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Tetrachlorobenzene[1,2,4,5] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Tetrachlorophenol[2,3,4,6-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Trichlorobenzene[1,2,4-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Trichlorophenol[2,4,5-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Trichlorophenol[2,4,6-] | U | UJ | SV3a | N | 10.0 | ug/L | 10.0 | ug/L | | | W | 10/06/2014 | | 1425972 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86962 | REG | INIT | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | | J | I10a | Y | 214 | mg/L | 214 | mg/L | | | W | 10/06/2014 | | 1425713 | VAL | Y |
| La Mesita Spring | 2015-40 | CAWR-14-86962 | REG | INIT | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | | U | I4 | N | 0.0712 | mg/L | 0.0712 | mg/L | | | W | 10/06/2014 | | 1425671 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86966 | REG | INIT | INORGANIC | SW-846:6020 | Arsenic | J | U | I4 | N | 3.56 | ug/L | 3.56 | ug/L | | | W | 10/06/2014 | | 1426078 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-40 | CAWR-14-86966 | REG | INIT | GENERAL CHEMISTRY | EPA:365.4 | Total Phosphate as Phosphorus | J | U | I4 | N | 0.0417 | mg/L | 0.0417 | mg/L | | | W | 10/06/2014 | | 1425671 | VAL | Y |

| Reason Code | Description |
|---|---|
| HE12a | The LCS percent recovery was < the Lower Acceptance Limit but >10%. Follow the external laboratory limits. |
| I10a | The sample and the duplicate sample results were >=5X the RL and the duplicate RPD was >20% for water samples and >35% for soil samples. |
| I4 | the sample result is =<5x the concentration of related analyte in the method blank. |
| I6b | The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. |
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| R5 | Analyte is not detected because the amount reported is less than the MDC. |
| R5a | The MDC and/or TPU documentation is missing. Data may not be acceptable for use. |
| SV3a | The surrogate is < the Lower Acceptance Level (LAL) but >=10%R. Follow the external laboratory limits located within the associated data package. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:120.1 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:150.1 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:160.1 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:245.2 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:300.0 | 0 | 4 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:310.1 | 0 | 2 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:335.4 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:350.1 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:351.2 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:353.2 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:365.4 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:900 | 0 | 2 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:901.1 | 0 | 5 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | EPA:905.0 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | HASL-300:AM-241 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | HASL-300:ISOPU | 0 | 2 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | HASL-300:ISOU | 0 | 3 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SM:A2340B | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:6010C | 0 | 17 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:6020 | 0 | 11 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:6850 | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8011 | 0 | 2 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8082 | 0 | 8 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8151A | 0 | 1 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8260B | 0 | 78 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8270D | 0 | 61 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8310 | 0 | 18 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8321A_MOD | 0 | 20 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:9060 | 0 | 1 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8011 | 0 | 2 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8082 | 0 | 8 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8151A | 0 | 1 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8260B | 0 | 78 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8270D | 0 | 61 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8310 | 0 | 18 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | EPA:245.2 | 0 | 1 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | EPA:335.4 | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | EPA:351.2 | 0 | 1 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | EPA:900 | 0 | 2 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | EPA:901.1 | 0 | 5 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | EPA:905.0 | 0 | 1 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | HASL-300:AM-241 | 0 | 1 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | HASL-300:ISOPU | 0 | 2 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | HASL-300:ISOU | 0 | 3 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8011 | 0 | 2 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8082 | 0 | 8 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8151A | 0 | 1 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8260B | 0 | 78 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8270D | 0 | 61 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8310 | 0 | 18 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:9060 | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:120.1 | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:150.1 | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:160.1 | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:245.2 | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:300.0 | 0 | 4 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:310.1 | 0 | 2 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:350.1 | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:353.2 | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | EPA:365.4 | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | SM:A2340B | 0 | 1 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | SW-846:6010C | 0 | 17 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | SW-846:6020 | 0 | 11 |
| CAWR-14-86884 | Rio Grande at Otowi Bridge | FD | SW-846:6850 | 0 | 1 |
| CAWR-14-86910 | Rio Grande at Otowi Bridge | FTB | SW-846:8011 | 0 | 2 |
| CAWR-14-86910 | Rio Grande at Otowi Bridge | FTB | SW-846:8260B | 0 | 78 |
| CAWR-14-86912 | La Mesita Spring | FTB | SW-846:8011 | 0 | 2 |
| CAWR-14-86912 | La Mesita Spring | FTB | SW-846:8260B | 0 | 78 |
| CAWR-14-86935 | La Mesita Spring | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-86935 | La Mesita Spring | REG | EPA:335.4 | 0 | 1 |
| CAWR-14-86935 | La Mesita Spring | REG | EPA:351.2 | 0 | 1 |
| CAWR-14-86935 | La Mesita Spring | REG | EPA:900 | 0 | 2 |
| CAWR-14-86935 | La Mesita Spring | REG | EPA:901.1 | 0 | 5 |
| CAWR-14-86935 | La Mesita Spring | REG | EPA:905.0 | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86935 | La Mesita Spring | REG | HASL-300:AM-241 | 0 | 1 |
| CAWR-14-86935 | La Mesita Spring | REG | HASL-300:ISOPU | 0 | 2 |
| CAWR-14-86935 | La Mesita Spring | REG | HASL-300:ISOU | 0 | 3 |
| CAWR-14-86935 | La Mesita Spring | REG | SW-846:8011 | 0 | 2 |
| CAWR-14-86935 | La Mesita Spring | REG | SW-846:8151A | 0 | 1 |
| CAWR-14-86935 | La Mesita Spring | REG | SW-846:8260B | 0 | 78 |
| CAWR-14-86935 | La Mesita Spring | REG | SW-846:8310 | 0 | 18 |
| CAWR-14-86935 | La Mesita Spring | REG | SW-846:9060 | 0 | 1 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | EPA:335.4 | 0 | 1 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | EPA:351.2 | 0 | 1 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | EPA:900 | 0 | 2 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | EPA:901.1 | 0 | 5 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | EPA:905.0 | 0 | 1 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | HASL-300:AM-241 | 0 | 1 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | HASL-300:ISOPU | 0 | 2 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | HASL-300:ISOU | 0 | 3 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8011 | 0 | 2 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8082 | 0 | 8 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8151A | 0 | 1 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8260B | 0 | 78 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8270D | 0 | 61 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8310 | 0 | 18 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:9060 | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:120.1 | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:150.1 | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:160.1 | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:300.0 | 0 | 4 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:310.1 | 0 | 2 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:350.1 | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:353.2 | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | EPA:365.4 | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | SM:A2340B | 0 | 1 |
| CAWR-14-86962 | La Mesita Spring | REG | SW-846:6010C | 0 | 17 |
| CAWR-14-86962 | La Mesita Spring | REG | SW-846:6020 | 0 | 11 |
| CAWR-14-86962 | La Mesita Spring | REG | SW-846:6850 | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:120.1 | 0 | 1 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:150.1 | 0 | 1 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:160.1 | 0 | 1 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:300.0 | 0 | 4 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:310.1 | 0 | 2 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:350.1 | 0 | 1 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:353.2 | 0 | 1 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | EPA:365.4 | 0 | 1 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | SM:A2340B | 0 | 1 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | SW-846:6010C | 0 | 17 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | SW-846:6020 | 0 | 11 |
| CAWR-14-86966 | Rio Grande at Otowi Bridge | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

November 04, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Groundwater Samples
Work Order: 358468
SDG: 2015-40

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on October 08, 2014, and analyzed for Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2015-40
Enclosures

**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Work Order #: 358468**
**SDG: 2015-40**

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# Case Narrative

**Case Narrative for**
**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Workorder #: 358468**
**SDG # : 2015-40**

**November 04, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on October 08, 2014 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 358468001 | CAWR-14-86935 |
| 358468002 | CAWR-14-86935 |
| 358468003 | CAWR-14-86935 |
| 358468004 | CAWR-14-86935 |
| 358468005 | CAWR-14-86962 |
| 358468006 | CAWR-14-86912 |
| 358468007 | CAWR-14-86912 |
| 358468008 | CAWR-14-86939 |
| 358468009 | CAWR-14-86939 |
| 358468010 | CAWR-14-86939 |
| 358468011 | CAWR-14-86939 |
| 358468012 | CAWR-14-86939 |
| 358468013 | CAWR-14-86966 |
| 358468014 | CAWR-14-86874 |
| 358468015 | CAWR-14-86874 |
| 358468016 | CAWR-14-86874 |
| 358468017 | CAWR-14-86874 |
| 358468018 | CAWR-14-86874 |
| 358468019 | CAWR-14-86874 |
| 358468020 | CAWR-14-86875 |
| 358468021 | CAWR-14-86875 |
| 358468022 | CAWR-14-86875 |
| 358468023 | CAWR-14-86875 |
| 358468024 | CAWR-14-86875 |

| | |
|---|---|
| 358468025 | CAWR-14-86880 |
| 358468026 | CAWR-14-86880 |
| 358468027 | CAWR-14-86880 |
| 358468028 | CAWR-14-86880 |
| 358468029 | CAWR-14-86880 |
| 358468030 | CAWR-14-86884 |
| 358468031 | CAWR-14-86910 |
| 358468032 | CAWR-14-86910 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 04 November 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−14−9 |
| Utah NELAP | SC000122014−16 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

358468

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-40

Page 1 of 1

Client Contact:

Lab Agreement # : 126310011

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8011-TB | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8151A-PCP | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-86935 | Oct 6 2014 | 09:40 | W | 1 | 2 | | | 2 | | 2 | | | 1 | | 1 | 2 | | 1 | 1 |
| CAWR-14-86962 | Oct 6 2014 | 09:40 | W | | | | | | | | | 1 | | 1 | | | 1 | | |
| CAWR-14-86912 | Oct 6 2014 | 09:40 | W | | | 1 | | 2 | | | | | | | | | | | |
| CAWR-14-86939 | Oct 6 2014 | 10:55 | W | 1 | 2 | | 3 | 2 | 2 | 2 | | | 1 | | 1 | 2 | | 1 | 1 |
| CAWR-14-86966 | Oct 6 2014 | 10:55 | W | | | | | | | | | 1 | | 1 | | | 1 | | |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 1 | 2 | | 3 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| CAWR-14-86875 | Oct 6 2014 | 10:55 | W | | 2 | | 3 | 2 | 2 | 2 | | | | | | 2 | | | |
| CAWR-14-86880 | Oct 6 2014 | 10:55 | W | 1 | 2 | | 3 | 2 | 2 | 2 | | | 1 | | 1 | 2 | | 1 | 1 |
| CAWR-14-86884 | Oct 6 2014 | 10:55 | W | | | | | | | | | 1 | | 1 | | | 1 | | |
| CAWR-14-86910 | Oct 6 2014 | 10:55 | W | | | 1 | | 2 | | | | | | | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | [signature] | 10/7/14 3:00 | P. Nuent | Patricia Dent | 10/8/14 0915 |
| | | | | | |
| | | | | | |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| Client: LANL | SDG/AR/COC/Work Order: 2015-40 |
| Received By: T. Hunt | Date Received: 10/8/14 |

| Suspected Hazard Information | Yes | No | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | X | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0/CPM |
| Classified Radioactive II or III by RSO? | | X | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | X | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | X | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | X | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | X | |

| | Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | X | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius |
| 2a | Daily check performed and passed on IR temperature gun? | X | | | Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966 |
| 3 | Chain of custody documents included with shipment? | X | | | |
| 4 | Sample containers intact and sealed? | X | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | X | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | X | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | X | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | X | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | X | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | X | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | | | X | Sample ID's affected: See Continuation Form |
| 12 | Are sample containers identifiable as GEL provided? | X | | | |
| 13 | COC form is properly signed in relinquished/received sections? | X | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other<br>5908 1777 8782-2c 5908 1777 8760-3c<br>5908 1777 8771-3c 5908 1777 8738-5c<br>5908 1777 8750-3c<br>5908 1777 8749-4c<br>5908 1777 8727-2l |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials VSO Date 10/10/14 Page 1 of 2

GL-CHL-SR-001

GEL Laboratories LLC **SAMPLE RECEIPT & REVIEW CONTINUATION FORM**

Client: LANL Received By: P. Wlent Date Received: 10/8/14 SDG/AR/COC/Work Order: 2015-40

CAWR-14-86910, 86912 Lab rec'd (1) 8260b each chain indicates (2) each

CAWR-14-86875 Lab rec'd 1. Container Each For SVOA, PAH, PCB chain indicates 2 each 1. PCB chain indicates 3.

CAWR-14-26880 Lab rec'd 1. Container Each For SVOA, PCP, PAH chain indicates 2-each 1. PCB chain indicates 3.

CAWR-14-86874 Lab rec'd 1. Container Each For SVOA, PCP, PAC chain indicates 2-each, 1-PCB + 1-Hexp chain indicates 3 each.

PM (or PMA) review: Initials VSO Date 10/10/14 Page 2 of 2

The following issues occurred 10/08/14

RN#2015-40
CAWR-14-86910,86912 for 8260b, the lab received 1-container each chain indicates 2-each.

CAWR-14-86875 for SVOA, PAH, PCP the lab received 1-container each chain indicates 2-each,
1-PCB chain indicates 3.

CAWR-14-26880 for SVOA, PCP, PAH the lab received 1-container each chain indicates 2-each, 1-PCB chain indicates 3.

CAWR-14-86874 for SVOA, PCP, PAH the lab received 1-container each chain indicates 2-each, 1-PCB, HEXP chain indicates 3-each.

Thanks!!

--
Patricia Dent
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Rd.
Charleston, S.C. 29407
Main: 843-556-8171 Ext 4264
Fax: 843-766-1178
Email: pad@gel.com
Web: www.gel.com

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07OCT14
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR0A0VEC60R0

2c

FedEx Express

TRK# 0201 5908 1777 8782

WED - 08 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07OCT14
ACTWGT: 40.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

3c

FedEx Express

3 of 3

MPS# 0263 5908 1777 8771

Mstr# 5908 1777 8750 0201

WED - 08 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 66[illegible]-8966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03[illegible]

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07OCT14
ACTWGT: 42.0 LB MAN[illegible]
CAD: 0014176/CAFE2[illegible]05

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

3 C

FedEx Express

1 of 3

TRK# 0201 5908 1777 8750

## MASTER ##

X7 CHSA

WED - 08 OCT 10:30A
PRIORITY OVERNIGHT

29407
SC - US CHS

Part # 156148-434 RITZ 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07OCT14
ACTWGT: 42.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

4c

FedEx Express

3 of 3
MPS# 0263 5908 1777 8749
Mstr# 5908 1777 8727 0201

WED - 08 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RITZ 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07OCT14
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

21c

FedEx Express

1 of 3
TRK# 0201 5908 1777 8727
## MASTER ##

WED - 08 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RITZ 10/11

ORIGIN ID:SAF (505) 665-9966
KEITH GREENE LAB.
LOS ALAMOS NA DPU 03
TA00 BLDG 123
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07OCT14
ACTWGT: 43.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

3

FedEx Express

2 of 3
MPS# 0263 5908 1777 8760
Mstr# 5908 1777 8760

0201

WED - 08 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07OCT14
ACTWGT: 44.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

5

FedEx Express

2 of 3
MPS# 0263 5908 1777 8738
Mstr# 5908 1777 8727

0201

WED - 08 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# Case Narrative

**ChemStation Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer** |
| Analytical Method: | SW846 8260B DOE-AL |
| Analytical Batch Number: | 1429788 |

## Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468007 | CAWR-14-86912 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468024 | CAWR-14-86875 |
| 358468029 | CAWR-14-86880 |
| 358468032 | CAWR-14-86910 |
| 1203193525 | Method Blank (MB) |
| 1203193526 | Laboratory Control Sample (LCS) |
| 1203193527 | Laboratory Control Sample (LCS) |
| 1203193528 | 359236001(WST03-15-89331) Post Spike (PS) |
| 1203193529 | 359236001(WST03-15-89331) Post Spike Duplicate (PSD) |
| 1203193683 | 359236001(WST03-15-89331) Post Spike (PS) |
| 1203193684 | 359236001(WST03-15-89331) Post Spike Duplicate (PSD) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

## Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at

a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Blank (MB) Statement**
The blank analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Sample 359236001 (WST03-15-89331) was designated for spike analysis.

**Matrix Spike (PS) Recovery Statement**
Not all the matrix spike 1203193528 (WST03-15-89331) recoveries were within the acceptance limits. See Form 3 for specific recoveries.

**Matrix Spike Duplicate (PSD) Recovery Statement**
Not all the matrix spike duplicate 1203193529 (WST03-15-89331) recoveries were within the acceptance limits. See Form 3 for specific recoveries.

**Relative Percent Difference (RPD) Statement**
The RPDs between the matrix spike pair met the acceptance limits.

**Internal Standard (ISTD) Acceptance**
The internal standard responses in all client and quality control samples met the required acceptance criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. Samples were not analyzed within the recommended holding. However, the samples were analyzed within two times the holding period. This satisfies the client criteria.

**Sample Preservation and Integrity**
Samples 1203193528 (WST03-15-89331), 1203193529 (WST03-15-89331), 1203193683 (WST03-15-89331) and 1203193684 (WST03-15-89331) had pH values of 5 at the time of analysis.

**Sample Dilutions/Methanol Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-analyses were not required for samples in this SDG.

## Miscellaneous Information

### Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER# 1347478.

### Manual Integrations

Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

### TIC Comment

Tentatively identified compounds (TIC) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

### Additional Comments

Additional comments were not required for this SDG.

### Residual Chlorine

Residual Chlorine was not detected in any of the samples in this SDG.

## System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|---|---|---|---|---|---|
| VOAA.I | Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler | HP7890A/HP5975C | DB-624 | J&W, 60m x 0.25mm x 1.4um | Trap 10 |

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

H  Analytical holding time was exceeded

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert  **Name: Erin Haubert**

**Date: 03 NOV 2014**  **Title: Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468003** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86935** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 20:44** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 20:44** | | | | |
| **Data File:** | **102214\AD334.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468003** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86935** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 20:44** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 20:44** | | | | |
| **Data File:** | **102214\AD334.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468003** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86935** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 20:44** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 20:44** | | | | |
| **Data File:** | **102214\AD334.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 54.0 | 50.0 | ug/L | 108 | (77%-123%) |
| Bromofluorobenzene | 55.0 | 50.0 | ug/L | 110 | (80%-120%) |
| Toluene-d8 | 52.0 | 50.0 | ug/L | 104 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468007** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86912** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:09** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:09** | | | | |
| **Data File:** | **102214\AD335.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468007** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86912** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:09** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:09** | | | | |
| **Data File:** | **102214\AD335.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468007** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86912** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:09** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:09** | | | | |
| **Data File:** | **102214\AD335.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 54.6 | 50.0 | ug/L | 109 | (77%-123%) |
| Bromofluorobenzene | 54.7 | 50.0 | ug/L | 109 | (80%-120%) |
| Toluene-d8 | 52.4 | 50.0 | ug/L | 105 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468012** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:34** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:34** | | | | |
| **Data File:** | **102214\AD336.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468012** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:34** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:34** | | | | |
| **Data File:** | **102214\AD336.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468012** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:34** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:34** | | | | |
| **Data File:** | **102214\AD336.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.0 | 50.0 | ug/L | 110 | (77%-123%) |
| Bromofluorobenzene | 54.6 | 50.0 | ug/L | 109 | (80%-120%) |
| Toluene-d8 | 52.1 | 50.0 | ug/L | 104 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468019** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:59** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:59** | | | | |
| **Data File:** | **102214\AD337.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468019** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:59** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:59** | | | | |
| **Data File:** | **102214\AD337.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468019** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 21:59** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 21:59** | | | | |
| **Data File:** | **102214\AD337.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.4 | 50.0 | ug/L | 107 | (77%-123%) |
| Bromofluorobenzene | 54.9 | 50.0 | ug/L | 110 | (80%-120%) |
| Toluene-d8 | 51.2 | 50.0 | ug/L | 102 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468024** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 22:23** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 22:23** | | | | |
| **Data File:** | **102214\AD338.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468024** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 22:23** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 22:23** | | | | |
| **Data File:** | **102214\AD338.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468024** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 22:23** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 22:23** | | | | |
| **Data File:** | **102214\AD338.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.8 | 50.0 | ug/L | 112 | (77%-123%) |
| Bromofluorobenzene | 55.4 | 50.0 | ug/L | 111 | (80%-120%) |
| Toluene-d8 | 52.4 | 50.0 | ug/L | 105 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468029** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 22:48** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 22:48** | | | | |
| **Data File:** | **102214\AD339.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468029** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 22:48** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 22:48** | | | | |
| **Data File:** | **102214\AD339.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468029** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 22:48** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 22:48** | | | | |
| **Data File:** | **102214\AD339.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 55.1 | 50.0 | ug/L | 110 | (77%-123%) |
| Bromofluorobenzene | 55.0 | 50.0 | ug/L | 110 | (80%-120%) |
| Toluene-d8 | 52.0 | 50.0 | ug/L | 104 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468032** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86910** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 23:12** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 23:12** | | | | |
| **Data File:** | **102214\AD340.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468032** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86910** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 23:12** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 23:12** | | | | |
| **Data File:** | **102214\AD340.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | HU | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468032** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86910** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 23:12** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 23:12** | | | | |
| **Data File:** | **102214\AD340.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.4 | 50.0 | ug/L | 107 | (77%-123%) |
| Bromofluorobenzene | 55.1 | 50.0 | ug/L | 110 | (80%-120%) |
| Toluene-d8 | 51.3 | 50.0 | ug/L | 103 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown aromatic | 13.739 | 31.7 | ug/L | 0 | J |
| | unknown siloxane | 15.684 | 35.8 | ug/L | 0 | J |

# Quality Control Summary

**Volatile**

## Surrogate Recovery Report

**SDG Number: 2015-40**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|---|---|---|---|---|
| 1203193526 | LCS for batch 1429788 | 108 | 103 | 108 |
| 1203193527 | LCS for batch 1429788 | 105 | 104 | 109 |
| 1203193525 | MB for batch 1429788 | 105 | 104 | 107 |
| 358468003 | CAWR-14-86935 | 108 | 104 | 110 |
| 358468007 | CAWR-14-86912 | 109 | 105 | 109 |
| 358468012 | CAWR-14-86939 | 110 | 104 | 109 |
| 358468019 | CAWR-14-86874 | 107 | 102 | 110 |
| 358468024 | CAWR-14-86875 | 112 | 105 | 111 |
| 358468029 | CAWR-14-86880 | 110 | 104 | 110 |
| 358468032 | CAWR-14-86910 | 107 | 103 | 110 |
| 1203193528 | WST03-15-89331PS | 109 | 103 | 107 |
| 1203193529 | WST03-15-89331PSD | 107 | 104 | 109 |
| 1203193683 | WST03-15-89331PS | 104 | 101 | 109 |
| 1203193684 | WST03-15-89331PSD | 105 | 102 | 110 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| DCED4 | = 1,2-Dichloroethane-d4 | (77%-123%) |
| TOL | = Toluene-d8 | (80%-120%) |
| BFB | = Bromofluorobenzene | (80%-120%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1429788**
**Lab Sample ID** **1203193526**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/22/2014 19:06**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 102 | 102 | 78-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 1460 | 117 | 60-124 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 275 | 110 | 55-147 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 248 | 99 | 72-126 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 268 | 107 | 73-135 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 305 | 122 | 61-133 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 280 | 112 | 57-145 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 306 | 122 | 67-128 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 308 | 123 | 59-147 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 54.4 | 109 | 52-134 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 53.4 | 107 | 57-126 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 53.7 | 107 | 62-126 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 38.6 | 77 | 63-127 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 51.8 | 104 | 69-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 47.8 | 96 | 69-129 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 59.1 | 118 | 72-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 51.2 | 102 | 70-127 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 50.0 | 100 | 70-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 56.5 | 113 | 74-120 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 52.4 | 105 | 73-120 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 53.5 | 107 | 75-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 50.9 | 102 | 76-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1429788**
**Lab Sample ID** **1203193526**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/22/2014 19:06**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 54.4 | 109 | 76-131 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 51.9 | 104 | 76-122 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 52.7 | 105 | 76-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 52.3 | 105 | 76-131 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 49.9 | 100 | 73-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 52.5 | 105 | 76-135 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 53.9 | 108 | 71-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 49.7 | 99 | 75-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 49.9 | 100 | 77-123 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 54.8 | 110 | 76-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 54.4 | 109 | 77-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 57.6 | 115 | 78-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 58.1 | 116 | 78-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 50.6 | 101 | 75-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 59.9 | 120 | 78-124 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 55.2 | 110 | 76-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 55.7 | 111 | 73-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 46.2 | 92 | 73-125 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 62.3 | 125 | 72-131 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 50.2 | 100 | 77-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 52.0 | 104 | 77-120 |
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 53.6 | 107 | 78-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1429788**
**Lab Sample ID** **1203193526**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/22/2014 19:06**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 57.8 | 116 | 79-124 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 64.2 | 128 | 65-132 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 54.5 | 109 | 76-123 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 59.5 | 119 | 72-122 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 56.9 | 114 | 71-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 51.9 | 104 | 76-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 51.7 | 103 | 75-121 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 54.2 | 108 | 77-122 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 51.5 | 103 | 76-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 54.2 | 108 | 76-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 53.5 | 107 | 77-127 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 53.6 | 107 | 77-121 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 53.9 | 108 | 77-124 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 53.0 | 106 | 77-126 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 51.1 | 102 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 49.6 | 99 | 76-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 53.6 | 107 | 76-127 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 50.3 | 101 | 69-133 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 59.6 | 119 | 67-129 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 53.6 | 107 | 66-131 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 51.6 | 103 | 68-132 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 55.5 | 111 | 80-126 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1429788**
**Lab Sample ID** **1203193526**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/22/2014 19:06**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 51.8 | 104 | 77-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 5920 | 118 | 61-135 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1429788**
**Lab Sample ID** **1203193527**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/22/2014 19:31**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 324 | 130 | 61-132 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 274 | 109 | 67-139 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 281 | 113 | 64-124 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 278 | 111 | 68-123 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 278 | 111 | 69-128 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 300 | 120 | 66-124 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 283 | 113 | 73-123 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 291 | 116 | 75-122 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 2840 | 114 | 64-132 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 60.4 | 121 | 60-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **WST03-15-89331PS**
**Lab Sample ID** **1203193528**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **10/23/2014 01:39**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PS | m,p-Xylenes | 100 | 0.00 | U | 103 | 103 | 69-122 |
| 75-05-8 | PS | Acetonitrile | 1250 | 0.00 | U | 1560 | 125 | 54-130 |
| 67-64-1 | PS | Acetone | 250 | 3.22 | J | 168 | 66 | 27-155 |
| 74-88-4 | PS | Iodomethane | 250 | 0.00 | U | 269 | 108 | 69-128 |
| 75-15-0 | PS | Carbon disulfide | 250 | 0.00 | U | 294 | 118 | 68-138 |
| 108-05-4 | PS | Vinyl acetate | 250 | 0.00 | U | 324 | 130 | 50-137 |
| 78-93-3 | PS | 2-Butanone | 250 | 0.00 | U | 236 | 94 | 30-145 |
| 108-10-1 | PS | 4-Methyl-2-pentanone | 250 | 0.00 | U | 311 | 124 | 60-132 |
| 591-78-6 | PS | 2-Hexanone | 250 | 0.00 | U | 300 | 120 | 38-144 |
| 75-71-8 | PS | Dichlorodifluoromethane | 50.0 | 0.00 | U | 60.9 | 122 | 37-143 |
| 74-87-3 | PS | Chloromethane | 50.0 | 0.00 | U | 59.2 | 118 | 48-132 |
| 75-01-4 | PS | Vinyl chloride | 50.0 | 0.00 | U | 58.6 | 117 | 53-132 |
| 74-83-9 | PS | Bromomethane | 50.0 | 0.00 | U | 41.7 | 83 | 60-132 |
| 75-00-3 | PS | Chloroethane | 50.0 | 0.00 | U | 56.0 | 112 | 66-120 |
| 75-69-4 | PS | Trichlorofluoromethane | 50.0 | 0.00 | U | 54.0 | 108 | 64-131 |
| 60-29-7 | PS | Ethyl ether | 50.0 | 0.00 | U | 59.9 | 120 * | 69-119 |
| 75-35-4 | PS | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 57.4 | 115 | 65-129 |
| 75-09-2 | PS | Methylene chloride | 50.0 | 1.46 | U | 53.9 | 105 | 68-119 |
| 1634-04-4 | PS | tert-Butyl methyl ether | 50.0 | 0.00 | U | 59.1 | 118 | 70-123 |
| 156-60-5 | PS | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 58.5 | 117 | 68-123 |
| 75-34-3 | PS | 1,1-Dichloroethane | 50.0 | 0.00 | U | 60.6 | 121 | 71-122 |
| 156-59-2 | PS | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 55.5 | 111 | 72-122 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **WST03-15-89331PS**
**Lab Sample ID** **1203193528**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **10/23/2014 01:39**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PS | 2,2-Dichloropropane | 50.0 | 0.00 | U | 59.6 | 119 | 69-131 |
| 74-97-5 | PS | Bromochloromethane | 50.0 | 0.00 | U | 54.8 | 110 | 74-123 |
| 67-66-3 | PS | Chloroform | 50.0 | 0.00 | U | 59.6 | 119 | 72-123 |
| 71-55-6 | PS | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 61.1 | 122 | 71-133 |
| 563-58-6 | PS | 1,1-Dichloropropene | 50.0 | 0.00 | U | 56.4 | 113 | 68-125 |
| 56-23-5 | PS | Carbon tetrachloride | 50.0 | 0.00 | U | 61.7 | 123 | 70-139 |
| 107-06-2 | PS | 1,2-Dichloroethane | 50.0 | 0.00 | U | 60.3 | 121 | 67-123 |
| 71-43-2 | PS | Benzene | 50.0 | 0.00 | U | 54.6 | 109 | 71-118 |
| 79-01-6 | PS | Trichloroethylene | 50.0 | 0.00 | U | 54.6 | 109 | 68-130 |
| 78-87-5 | PS | 1,2-Dichloropropane | 50.0 | 0.00 | U | 59.6 | 119 * | 72-118 |
| 74-95-3 | PS | Dibromomethane | 50.0 | 0.00 | U | 57.2 | 114 | 74-122 |
| 75-27-4 | PS | Bromodichloromethane | 50.0 | 0.00 | U | 63.2 | 126 | 75-129 |
| 10061-01-5 | PS | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 58.4 | 117 | 73-125 |
| 108-88-3 | PS | Toluene | 50.0 | 0.00 | U | 54.2 | 108 | 69-119 |
| 10061-02-6 | PS | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 61.4 | 123 | 73-125 |
| 79-00-5 | PS | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 58.4 | 117 | 73-118 |
| 142-28-9 | PS | 1,3-Dichloropropane | 50.0 | 0.00 | U | 58.8 | 118 * | 71-116 |
| 127-18-4 | PS | Tetrachloroethylene | 50.0 | 0.00 | U | 48.8 | 98 | 65-128 |
| 124-48-1 | PS | Dibromochloromethane | 50.0 | 0.00 | U | 65.6 | 131 | 68-133 |
| 108-90-7 | PS | Chlorobenzene | 50.0 | 0.00 | U | 50.9 | 102 | 71-119 |
| 100-41-4 | PS | Ethylbenzene | 50.0 | 0.00 | U | 53.3 | 107 | 70-121 |
| 95-47-6 | PS | o-Xylene | 50.0 | 0.00 | U | 54.1 | 108 | 70-123 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **WST03-15-89331PS**
**Lab Sample ID** **1203193528**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **10/23/2014 01:39**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 100-42-5 | PS | Styrene | 50.0 | 0.00 | U | 55.2 | 110 | 72-127 |
| 75-25-2 | PS | Bromoform | 50.0 | 0.00 | U | 63.9 | 128 | 60-133 |
| 98-82-8 | PS | Isopropylbenzene | 50.0 | 0.00 | U | 54.7 | 109 | 67-127 |
| 79-34-5 | PS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 61.3 | 123 | 67-125 |
| 96-18-4 | PS | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 60.0 | 120 | 68-123 |
| 108-86-1 | PS | Bromobenzene | 50.0 | 0.00 | U | 50.9 | 102 | 69-120 |
| 103-65-1 | PS | n-Propylbenzene | 50.0 | 0.00 | U | 49.7 | 99 | 65-125 |
| 108-67-8 | PS | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 52.7 | 105 | 67-126 |
| 95-49-8 | PS | 2-Chlorotoluene | 50.0 | 0.00 | U | 49.6 | 99 | 67-122 |
| 106-43-4 | PS | 4-Chlorotoluene | 50.0 | 0.00 | U | 51.5 | 103 | 66-121 |
| 98-06-6 | PS | tert-Butylbenzene | 50.0 | 0.00 | U | 52.5 | 105 | 67-130 |
| 95-63-6 | PS | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 50.9 | 102 | 66-124 |
| 135-98-8 | PS | sec-Butylbenzene | 50.0 | 0.00 | U | 51.9 | 104 | 67-128 |
| 99-87-6 | PS | 4-Isopropyltoluene | 50.0 | 0.00 | U | 49.3 | 99 | 66-129 |
| 541-73-1 | PS | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 47.4 | 95 | 67-120 |
| 106-46-7 | PS | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 45.5 | 91 | 66-118 |
| 104-51-8 | PS | n-Butylbenzene | 50.0 | 0.00 | U | 47.9 | 96 | 63-131 |
| 87-68-3 | PS | Hexachlorobutadiene | 50.0 | 0.00 | U | 43.2 | 86 | 55-138 |
| 91-20-3 | PS | Naphthalene | 50.0 | 0.00 | U | 57.6 | 115 | 61-131 |
| 87-61-6 | PS | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 48.2 | 96 | 56-133 |
| 120-82-1 | PS | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 45.1 | 90 | 56-131 |
| 630-20-6 | PS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 58.9 | 118 | 76-129 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Sample Type:** **Post Spike**
**Client ID:** **WST03-15-89331PS**
**Matrix:** **W**
**Lab Sample ID** **1203193528**
**Instrument:** **VOAA.I**
**Analysis Date:** **10/23/2014 01:39**
**Dilution: 1**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 95-50-1 | PS | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 49.0 | 98 | 69-119 |
| 71-36-3 | PS | n-Butyl alcohol | 5000 | 0.00 | U | 5850 | 117 | 55-141 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **WST03-15-89331PSD**
**Lab Sample ID** **1203193529**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/23/2014 02:03**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PSD | m,p-Xylenes | 100 | 0.00 | U | 104 | 104 | 69-122 | 1 | 0-20 |
| 75-05-8 | PSD | Acetonitrile | 1250 | 0.00 | U | 1550 | 124 | 54-130 | 1 | 0-20 |
| 67-64-1 | PSD | Acetone | 250 | 3.22 | J | 172 | 67 | 27-155 | 2 | 0-20 |
| 74-88-4 | PSD | Iodomethane | 250 | 0.00 | U | 262 | 105 | 69-128 | 2 | 0-20 |
| 75-15-0 | PSD | Carbon disulfide | 250 | 0.00 | U | 289 | 116 | 68-138 | 2 | 0-20 |
| 108-05-4 | PSD | Vinyl acetate | 250 | 0.00 | U | 334 | 134 | 50-137 | 3 | 0-20 |
| 78-93-3 | PSD | 2-Butanone | 250 | 0.00 | U | 241 | 96 | 30-145 | 2 | 0-20 |
| 108-10-1 | PSD | 4-Methyl-2-pentanone | 250 | 0.00 | U | 324 | 130 | 60-132 | 4 | 0-20 |
| 591-78-6 | PSD | 2-Hexanone | 250 | 0.00 | U | 302 | 121 | 38-144 | 1 | 0-20 |
| 75-71-8 | PSD | Dichlorodifluoromethane | 50.0 | 0.00 | U | 58.8 | 118 | 37-143 | 3 | 0-20 |
| 74-87-3 | PSD | Chloromethane | 50.0 | 0.00 | U | 57.6 | 115 | 48-132 | 3 | 0-20 |
| 75-01-4 | PSD | Vinyl chloride | 50.0 | 0.00 | U | 57.7 | 115 | 53-132 | 2 | 0-20 |
| 74-83-9 | PSD | Bromomethane | 50.0 | 0.00 | U | 39.1 | 78 | 60-132 | 6 | 0-20 |
| 75-00-3 | PSD | Chloroethane | 50.0 | 0.00 | U | 54.9 | 110 | 66-120 | 2 | 0-20 |
| 75-69-4 | PSD | Trichlorofluoromethane | 50.0 | 0.00 | U | 52.2 | 104 | 64-131 | 3 | 0-20 |
| 60-29-7 | PSD | Ethyl ether | 50.0 | 0.00 | U | 61.3 | 123 * | 69-119 | 2 | 0-20 |
| 75-35-4 | PSD | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 55.8 | 112 | 65-129 | 3 | 0-20 |
| 75-09-2 | PSD | Methylene chloride | 50.0 | 1.46 | U | 53.3 | 104 | 68-119 | 1 | 0-20 |
| 1634-04-4 | PSD | tert-Butyl methyl ether | 50.0 | 0.00 | U | 58.2 | 116 | 70-123 | 2 | 0-20 |
| 156-60-5 | PSD | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 57.3 | 115 | 68-123 | 2 | 0-20 |
| 75-34-3 | PSD | 1,1-Dichloroethane | 50.0 | 0.00 | U | 59.1 | 118 | 71-122 | 3 | 0-20 |
| 156-59-2 | PSD | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 55.0 | 110 | 72-122 | 1 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Sample Type:** **Post Spike Duplicate**
**Client ID:** **WST03-15-89331PSD**
**Matrix:** **W**
**Lab Sample ID** **1203193529**
**Instrument:** **VOAA.I**
**Analysis Date:** **10/23/2014 02:03**
**Dilution: 1**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PSD | 2,2-Dichloropropane | 50.0 | 0.00 | U | 57.4 | 115 | 69-131 | 4 | 0-20 |
| 74-97-5 | PSD | Bromochloromethane | 50.0 | 0.00 | U | 55.0 | 110 | 74-123 | 0 | 0-20 |
| 67-66-3 | PSD | Chloroform | 50.0 | 0.00 | U | 58.3 | 117 | 72-123 | 2 | 0-20 |
| 71-55-6 | PSD | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 58.7 | 117 | 71-133 | 4 | 0-20 |
| 563-58-6 | PSD | 1,1-Dichloropropene | 50.0 | 0.00 | U | 55.5 | 111 | 68-125 | 2 | 0-20 |
| 56-23-5 | PSD | Carbon tetrachloride | 50.0 | 0.00 | U | 59.2 | 118 | 70-139 | 4 | 0-20 |
| 107-06-2 | PSD | 1,2-Dichloroethane | 50.0 | 0.00 | U | 58.8 | 118 | 67-123 | 3 | 0-20 |
| 71-43-2 | PSD | Benzene | 50.0 | 0.00 | U | 54.6 | 109 | 71-118 | 0 | 0-20 |
| 79-01-6 | PSD | Trichloroethylene | 50.0 | 0.00 | U | 54.0 | 108 | 68-130 | 1 | 0-20 |
| 78-87-5 | PSD | 1,2-Dichloropropane | 50.0 | 0.00 | U | 59.1 | 118 | 72-118 | 1 | 0-20 |
| 74-95-3 | PSD | Dibromomethane | 50.0 | 0.00 | U | 57.0 | 114 | 74-122 | 0 | 0-20 |
| 75-27-4 | PSD | Bromodichloromethane | 50.0 | 0.00 | U | 62.3 | 125 | 75-129 | 1 | 0-20 |
| 10061-01-5 | PSD | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 58.2 | 116 | 73-125 | 0 | 0-20 |
| 108-88-3 | PSD | Toluene | 50.0 | 0.00 | U | 54.8 | 110 | 69-119 | 1 | 0-20 |
| 10061-02-6 | PSD | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 61.4 | 123 | 73-125 | 0 | 0-20 |
| 79-00-5 | PSD | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 58.5 | 117 | 73-118 | 0 | 0-20 |
| 142-28-9 | PSD | 1,3-Dichloropropane | 50.0 | 0.00 | U | 58.7 | 117 * | 71-116 | 0 | 0-20 |
| 127-18-4 | PSD | Tetrachloroethylene | 50.0 | 0.00 | U | 49.6 | 99 | 65-128 | 2 | 0-20 |
| 124-48-1 | PSD | Dibromochloromethane | 50.0 | 0.00 | U | 65.4 | 131 | 68-133 | 0 | 0-20 |
| 108-90-7 | PSD | Chlorobenzene | 50.0 | 0.00 | U | 51.3 | 103 | 71-119 | 1 | 0-20 |
| 100-41-4 | PSD | Ethylbenzene | 50.0 | 0.00 | U | 53.7 | 107 | 70-121 | 1 | 0-20 |
| 95-47-6 | PSD | o-Xylene | 50.0 | 0.00 | U | 55.1 | 110 | 70-123 | 2 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **WST03-15-89331PSD**
**Lab Sample ID** **1203193529**
**Instrument:** **VOAA.I**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/23/2014 02:03**
**Dilution: 1**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 100-42-5 | PSD | Styrene | 50.0 | 0.00 | U | 55.3 | 111 | 72-127 | 0 | 0-20 |
| 75-25-2 | PSD | Bromoform | 50.0 | 0.00 | U | 66.1 | 132 | 60-133 | 3 | 0-20 |
| 98-82-8 | PSD | Isopropylbenzene | 50.0 | 0.00 | U | 57.3 | 115 | 67-127 | 5 | 0-20 |
| 79-34-5 | PSD | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 64.2 | 128 * | 67-125 | 5 | 0-20 |
| 96-18-4 | PSD | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 61.8 | 124 * | 68-123 | 3 | 0-20 |
| 108-86-1 | PSD | Bromobenzene | 50.0 | 0.00 | U | 52.4 | 105 | 69-120 | 3 | 0-20 |
| 103-65-1 | PSD | n-Propylbenzene | 50.0 | 0.00 | U | 51.2 | 102 | 65-125 | 3 | 0-20 |
| 108-67-8 | PSD | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 54.5 | 109 | 67-126 | 3 | 0-20 |
| 95-49-8 | PSD | 2-Chlorotoluene | 50.0 | 0.00 | U | 51.6 | 103 | 67-122 | 4 | 0-20 |
| 106-43-4 | PSD | 4-Chlorotoluene | 50.0 | 0.00 | U | 52.1 | 104 | 66-121 | 1 | 0-20 |
| 98-06-6 | PSD | tert-Butylbenzene | 50.0 | 0.00 | U | 54.3 | 109 | 67-130 | 3 | 0-20 |
| 95-63-6 | PSD | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 52.1 | 104 | 66-124 | 2 | 0-20 |
| 135-98-8 | PSD | sec-Butylbenzene | 50.0 | 0.00 | U | 53.1 | 106 | 67-128 | 2 | 0-20 |
| 99-87-6 | PSD | 4-Isopropyltoluene | 50.0 | 0.00 | U | 49.6 | 99 | 66-129 | 0 | 0-20 |
| 541-73-1 | PSD | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 48.0 | 96 | 67-120 | 1 | 0-20 |
| 106-46-7 | PSD | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 45.5 | 91 | 66-118 | 0 | 0-20 |
| 104-51-8 | PSD | n-Butylbenzene | 50.0 | 0.00 | U | 46.7 | 93 | 63-131 | 3 | 0-20 |
| 87-68-3 | PSD | Hexachlorobutadiene | 50.0 | 0.00 | U | 38.9 | 78 | 55-138 | 10 | 0-20 |
| 91-20-3 | PSD | Naphthalene | 50.0 | 0.00 | U | 57.2 | 114 | 61-131 | 1 | 0-20 |
| 87-61-6 | PSD | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 47.3 | 95 | 56-133 | 2 | 0-20 |
| 120-82-1 | PSD | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 43.6 | 87 | 56-131 | 3 | 0-20 |
| 630-20-6 | PSD | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 60.1 | 120 | 76-129 | 2 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Sample Type:** **Post Spike Duplicate**
**Client ID:** **WST03-15-89331PSD**
**Matrix:** **W**
**Lab Sample ID** **1203193529**
**Instrument:** **VOAA.I**
**Analysis Date:** **10/23/2014 02:03**
**Dilution: 1**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-50-1 | PSD | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 49.2 | 98 | 69-119 | 0 | 0-20 |
| 71-36-3 | PSD | n-Butyl alcohol | 5000 | 0.00 | U | 6110 | 122 | 55-141 | 4 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Sample Type:** **Post Spike**
**Client ID:** **WST03-15-89331PS**
**Matrix:** **W**
**Lab Sample ID** **1203193683**
**Instrument:** **VOAA.I**
**Analysis Date:** **10/23/2014 02:28**
**Dilution: 1**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PS | Acrolein | 250 | 0.00 | U | 358 | 143 * | 48-138 |
| 76-13-1 | PS | Trichlorotrifluoroethane | 250 | 0.00 | U | 290 | 116 | 63-146 |
| 107-05-1 | PS | Allyl chloride | 250 | 0.00 | U | 279 | 111 | 61-126 |
| 107-13-1 | PS | Acrylonitrile | 250 | 0.00 | U | 292 | 117 | 62-128 |
| 107-12-0 | PS | Propionitrile | 250 | 0.00 | U | 293 | 117 | 63-133 |
| 126-98-7 | PS | Methacrylonitrile | 250 | 0.00 | U | 316 | 126 | 61-131 |
| 80-62-6 | PS | Methyl methacrylate | 250 | 0.00 | U | 288 | 115 | 69-127 |
| 97-63-2 | PS | Ethyl methacrylate | 250 | 0.00 | U | 281 | 112 | 70-126 |
| 78-83-1 | PS | Isobutyl alcohol | 2500 | 0.00 | U | 2840 | 114 | 57-139 |
| 126-99-8 | PS | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 59.2 | 118 | 56-140 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Sample Type:** **Post Spike Duplicate**
**Client ID:** **WST03-15-89331PSD**
**Matrix:** **W**
**Lab Sample ID** **1203193684**
**Instrument:** **VOAA.I**
**Analysis Date:** **10/23/2014 02:53**
**Dilution: 1**
**Analyst:** **CDS1**
**Purge Vol:** **5 mL**
**Batch ID:** **1429788**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PSD | Acrolein | 250 | 0.00 | U | 365 | 146 * | 48-138 | 2 | 0-20 |
| 76-13-1 | PSD | Trichlorotrifluoroethane | 250 | 0.00 | U | 292 | 117 | 63-146 | 1 | 0-20 |
| 107-05-1 | PSD | Allyl chloride | 250 | 0.00 | U | 279 | 112 | 61-126 | 0 | 0-20 |
| 107-13-1 | PSD | Acrylonitrile | 250 | 0.00 | U | 298 | 119 | 62-128 | 2 | 0-20 |
| 107-12-0 | PSD | Propionitrile | 250 | 0.00 | U | 302 | 121 | 63-133 | 3 | 0-20 |
| 126-98-7 | PSD | Methacrylonitrile | 250 | 0.00 | U | 323 | 129 | 61-131 | 2 | 0-20 |
| 80-62-6 | PSD | Methyl methacrylate | 250 | 0.00 | U | 294 | 118 | 69-127 | 2 | 0-20 |
| 97-63-2 | PSD | Ethyl methacrylate | 250 | 0.00 | U | 290 | 116 | 70-126 | 3 | 0-20 |
| 78-83-1 | PSD | Isobutyl alcohol | 2500 | 0.00 | U | 2920 | 117 | 57-139 | 3 | 0-20 |
| 126-99-8 | PSD | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 60.2 | 120 | 56-140 | 2 | 0-20 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1429788** | **Instrument ID:** | **VOAA.I** | **Data File:** | **102214\AD332.D** |
| **Lab Sample ID:** | **1203193525** | **Prep Date:** | **10/22/2014 19:56** | **Analyzed:** | **10/22/14 19:56** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| | Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 01 | LCS for batch 1429788 | 1203193526 | 102214\AD330.D | 10/22/14 | 1906 |
| 02 | LCS for batch 1429788 | 1203193527 | 102214\AD331SL.D | 10/22/14 | 1931 |
| 03 | CAWR-14-86935 | 358468003 | 102214\AD334.D | 10/22/14 | 2044 |
| 04 | CAWR-14-86912 | 358468007 | 102214\AD335.D | 10/22/14 | 2109 |
| 05 | CAWR-14-86939 | 358468012 | 102214\AD336.D | 10/22/14 | 2134 |
| 06 | CAWR-14-86874 | 358468019 | 102214\AD337.D | 10/22/14 | 2159 |
| 07 | CAWR-14-86875 | 358468024 | 102214\AD338.D | 10/22/14 | 2223 |
| 08 | CAWR-14-86880 | 358468029 | 102214\AD339.D | 10/22/14 | 2248 |
| 09 | CAWR-14-86910 | 358468032 | 102214\AD340.D | 10/22/14 | 2312 |
| 10 | WST03-15-89331PS | 1203193528 | 102214\AD346.D | 10/23/14 | 0139 |
| 11 | WST03-15-89331PSD | 1203193529 | 102214\AD347.D | 10/23/14 | 0203 |
| 12 | WST03-15-89331PS | 1203193683 | 102214\AD348.D | 10/23/14 | 0228 |
| 13 | WST03-15-89331PSD | 1203193684 | 102214\AD349.D | 10/23/14 | 0253 |

# Quality Control Data

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193525** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:56** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:56** | | | | |
| **Data File:** | **102214\AD332.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193525** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:56** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:56** | | | | |
| **Data File:** | **102214\AD332.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193525** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:56** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:56** | | | | |
| **Data File:** | **102214\AD332.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.3 | 50.0 | ug/L | 105 | (77%-123%) |
| Bromofluorobenzene | 53.7 | 50.0 | ug/L | 107 | (80%-120%) |
| Toluene-d8 | 51.9 | 50.0 | ug/L | 104 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193526** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:06** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:06** | | | | |
| **Data File:** | **102214\AD330.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 55.5 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 52.3 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 59.5 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 55.2 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 53.5 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 51.2 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 49.9 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 53.6 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 56.9 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 51.6 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 53.6 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 51.8 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 53.9 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 54.8 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 54.2 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 51.1 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 55.7 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 49.6 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 54.4 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 280 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 51.5 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 308 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 54.2 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 53.0 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 306 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 275 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 1460 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 49.7 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 51.9 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 51.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 57.6 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 64.2 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 38.6 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 268 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193526** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:06** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:06** | | | | |
| **Data File:** | **102214\AD330.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 52.5 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 50.2 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 51.8 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 52.7 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 53.4 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 62.3 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 54.4 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 54.4 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 59.1 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 52.0 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 50.3 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 248 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 54.5 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 50.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 59.6 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 57.8 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 46.2 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 50.6 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 49.9 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 47.8 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 305 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 53.7 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 50.9 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 58.1 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 102 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 5920 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 53.6 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 51.7 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 53.6 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 53.9 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 56.5 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 53.5 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193526** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:06** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:06** | | | | |
| **Data File:** | **102214\AD330.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 52.4 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 59.9 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.9 | 50.0 | ug/L | 108 | (77%-123%) |
| Bromofluorobenzene | 53.9 | 50.0 | ug/L | 108 | (80%-120%) |
| Toluene-d8 | 51.4 | 50.0 | ug/L | 103 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193527** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:31** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:31** | | | | |
| **Data File:** | **102214\AD331SL.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 60.4 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 324 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 278 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 281 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193527** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:31** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:31** | | | | |
| **Data File:** | **102214\AD331SL.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 291 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2840 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 300 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 283 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 278 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 274 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203193527** | | | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1429788** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/22/2014 19:31** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/22/2014 19:31** | | | | |
| **Data File:** | **102214\AD331SL.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.7 | 50.0 | ug/L | 105 | (77%-123%) |
| Bromofluorobenzene | 54.6 | 50.0 | ug/L | 109 | (80%-120%) |
| Toluene-d8 | 51.9 | 50.0 | ug/L | 104 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193528** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 01:39** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 01:39** | | | | |
| **Data File:** | **102214\AD346.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 58.9 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 61.1 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 61.3 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 58.4 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 60.6 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 57.4 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 56.4 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 48.2 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 60.0 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 45.1 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 50.9 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 49.0 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 60.3 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 59.6 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 52.7 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 47.4 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 58.8 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 45.5 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 59.6 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 236 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 49.6 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 300 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 51.5 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 49.3 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 311 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 168 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 1560 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 54.6 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 50.9 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 54.8 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 63.2 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 63.9 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 41.7 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 294 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193528** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 01:39** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 01:39** | | | | |
| **Data File:** | **102214\AD346.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 61.7 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 50.9 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 56.0 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 59.6 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 59.2 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 65.6 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 57.2 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 60.9 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 59.9 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 53.3 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 43.2 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 269 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 54.7 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 53.9 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 57.6 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 55.2 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 48.8 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 54.2 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 54.6 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 54.0 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 324 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 58.6 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 55.5 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 58.4 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 103 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 5850 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 47.9 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 49.7 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 54.1 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 51.9 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 59.1 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 52.5 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193528** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 01:39** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 01:39** | | | | |
| **Data File:** | **102214\AD346.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 58.5 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 61.4 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 54.3 | 50.0 | ug/L | 109 | (77%-123%) |
| Bromofluorobenzene | 53.7 | 50.0 | ug/L | 107 | (80%-120%) |
| Toluene-d8 | 51.5 | 50.0 | ug/L | 103 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193529** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:03** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:03** | | | | |
| **Data File:** | **102214\AD347.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 60.1 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 58.7 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 64.2 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 58.5 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 59.1 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 55.8 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 55.5 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 47.3 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 61.8 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 43.6 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 52.1 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 49.2 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 58.8 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 59.1 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 54.5 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 48.0 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 58.7 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 45.5 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 57.4 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 241 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 51.6 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 302 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 52.1 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 49.6 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 324 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 172 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 1550 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 54.6 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 52.4 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 55.0 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 62.3 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 66.1 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 39.1 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 289 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193529** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:03** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:03** | | | | |
| **Data File:** | **102214\AD347.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 59.2 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 51.3 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 54.9 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 58.3 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 57.6 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 65.4 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 57.0 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 58.8 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 61.3 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 53.7 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 38.9 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 262 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 57.3 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 53.3 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 57.2 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 55.3 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 49.6 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 54.8 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 54.0 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 52.2 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 334 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 57.7 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 55.0 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 58.2 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 104 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 6110 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 46.7 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 51.2 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 55.1 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 53.1 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 58.2 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 54.3 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193529** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:03** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:03** | | | | |
| **Data File:** | **102214\AD347.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 57.3 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 61.4 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.7 | 50.0 | ug/L | 107 | (77%-123%) |
| Bromofluorobenzene | 54.6 | 50.0 | ug/L | 109 | (80%-120%) |
| Toluene-d8 | 52.0 | 50.0 | ug/L | 104 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193683** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:28** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:28** | | | | |
| **Data File:** | **102214\AD348.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 59.2 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 358 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 292 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 279 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193683** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:28** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:28** | | | | |
| **Data File:** | **102214\AD348.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 281 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2840 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 316 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 288 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 293 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 290 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193683** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:28** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:28** | | | | |
| **Data File:** | **102214\AD348.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.2 | 50.0 | ug/L | 104 | (77%-123%) |
| Bromofluorobenzene | 54.3 | 50.0 | ug/L | 109 | (80%-120%) |
| Toluene-d8 | 50.4 | 50.0 | ug/L | 101 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193684** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:53** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:53** | | | | |
| **Data File:** | **102214\AD349.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 60.2 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 365 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 298 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 279 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193684** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:53** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:53** | | | | |
| **Data File:** | **102214\AD349.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 290 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2920 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 323 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 294 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 302 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 292 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/15/2014 09:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203193684** | **Date Received:** | **10/17/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1429788** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST03-15-89331PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1429788** | **Inst:** | **VOAA.I** | **Dilution:** | **1** |
| **Run Date:** | **10/23/2014 02:53** | **Analyst:** | **CDS1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **10/23/2014 02:53** | | | | |
| **Data File:** | **102214\AD349.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.7 | 50.0 | ug/L | 105 | (77%-123%) |
| Bromofluorobenzene | 55.1 | 50.0 | ug/L | 110 | (80%-120%) |
| Toluene-d8 | 51.1 | 50.0 | ug/L | 102 | (80%-120%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 23-OCT-14 | Federal | SOP | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| VOA GC/MS | 8260B | Liquid | ARSL001 |
| **Batch ID:** | **Sample Numbers:** | | |
| 1429788 | See Below | | |

**Potentially affected work order(s)(SDG): 358468(2015-40),358776(2015-59),359236(2015-87)**

**Application Issues:**

Failed Recovery for MS/PS

Sample Analyzed out of Holding

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. All samples were analyzed past the fourteenth day from collection but within twenty-eight days from collection.<br><br>2. The recoveries for several compounds were outside of acceptance limits in the MS and in the MSD performed on sample 359236001. | 1. Narrate and report data. The client's requirements were met.<br><br>2. Narrate and report data. As the MS and MSD displayed similar recoveries, the unacceptable recoveries were attributed to possible sample matrix interference and the data have been reported. The calculated relative percent differences between the MS and MSD were within acceptance limits for all requested compounds. |

**Originator's Name:**

Crystal Stacey 23-OCT-14

**Data Validator/Group Leader:**

Kelle Bellamy 24-OCT-14

# Semi-Volatile Analysis

# Case Narrative

**Semi-Volatile Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry** |
| Analytical Method: | SW846 3510C/8270D |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1425972 |
| Prep Batch Number: | 1425971 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

| Sample ID | Client ID |
|---|---|
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468024 | CAWR-14-86875 |
| 358468029 | CAWR-14-86880 |
| 1203184271 | MB for batch 1425971 |
| 1203184272 | Laboratory Control Sample (LCS) |
| 1203184273 | 358468012(CAWR-14-86939) Matrix Spike (MS) |
| 1203184274 | 358468012(CAWR-14-86939) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 33.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

**CCV Requirements**
All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D for samples 358468012 (CAWR-14-86939), 358468019 (CAWR-14-86874), 358468024 (CAWR-14-86875) and 358468029 (CAWR-14-86880). However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. Detected concentrations of these analytes should be considered as estimated.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG in this batch met the acceptance criteria.

**Surrogate Recoveries**
Sample 358468012 (CAWR-14-86939) failed surrogate recovery. Since there is insufficient sample remaining to perform a re-extraction, the results from this extraction are reported.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Sample 358468012 (CAWR-14-86939) was selected for analysis as the matrix spike and matrix spike duplicate.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD, 1203184274 (CAWR-14-86939), recovered Benzidine at 5.16%. The limits are 10-127%. The associated MS passed Benzidine recovery just above the low limit. The LCS passed Benzidine recovery. The data are reported.

**MS/MSD Relative Percent Difference (RPD) Statement**
The relative percent differences (RPD) for the MS and MSD, 1203184273 (CAWR-14-86939) and 1203184274 (CAWR-14-86939), were not within the acceptance limits. The failures were attributed to matrix interference. The data are reported.

**Internal Standard (ISTD) Acceptance**
The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the

associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception report 1343292 was generated for the samples 358468012 (CAWR-14-86939), 358468019 (CAWR-14-86874), 358468024 (CAWR-14-86875) and 358468029 (CAWR-14-86880) in this batch.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for 1203184271(MB) and samples 358468012 (CAWR-14-86939), 358468019 (CAWR-14-86874), 358468024 (CAWR-14-86875) and 358468029 (CAWR-14-86880) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| MSD8.I | Agilent 6890/5973 GC/MS w/ 7683 Autosampler | HP6890/HP5973 | DB-5MS | 25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 04 NOV 2014**  **Title: Data Validator**

# Sample Data Summary

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468012** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 20:00** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1215.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468012** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 20:00** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1215.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 118-74-1 | Hexachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | | Acceptable Limits |
|---|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 13.1 | 100 | ug/L | 13.1 | * | (33%-126%) |
| 2-Fluorobiphenyl | 29.7 | 50.0 | ug/L | 59.4 | | (35%-102%) |
| 2-Fluorophenol | 28.7 | 100 | ug/L | 28.7 | | (18%-84%) |
| Nitrobenzene-d5 | 32.6 | 50.0 | ug/L | 65.2 | | (38%-113%) |
| Phenol-d5 | 20.1 | 100 | ug/L | 20.1 | | (10%-110%) |
| p-Terphenyl-d14 | 28.4 | 50.0 | ug/L | 56.7 | | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000067-66-3 | Trichloromethane | 2.197 | 34.6 | ug/L | 94 | NJ |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468012** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 20:00** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1215.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.438 | 13.3 | ug/L | 0 | J |
| | unknown | 2.555 | 4.06 | ug/L | 0 | J |
| | unknown | 2.603 | 4.18 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468019** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 21:36** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **980 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1218.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 122-66-7 | Azobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 123-91-1 | 1,4-Dioxane | U | 10.2 | ug/L | 3.06 | 10.2 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.4 | ug/L | 5.10 | 20.4 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.02 | ug/L | 0.418 | 1.02 |
| 95-57-8 | 2-Chlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 88-75-5 | 2-Nitrophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.2 | ug/L | 3.06 | 10.2 |
| 59-50-7 | Parachlorometa cresol | U | 10.2 | ug/L | 3.06 | 10.2 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.2 | ug/L | 3.37 | 10.2 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.2 | ug/L | 3.06 | 10.2 |
| 100-02-7 | 4-Nitrophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 62-53-3 | Aniline | U | 10.2 | ug/L | 4.29 | 10.2 |
| 1912-24-9 | Atrazine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 92-87-5 | Benzidine | U | 10.2 | ug/L | 3.98 | 10.2 |
| 65-85-0 | Benzoic acid | U | 20.4 | ug/L | 6.12 | 20.4 |
| 100-51-6 | Benzyl alcohol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 85-68-7 | Butylbenzylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 84-74-2 | Di-n-butylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 117-84-0 | Di-n-octylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 132-64-9 | Dibenzofuran | U | 10.2 | ug/L | 3.06 | 10.2 |
| 84-66-2 | Diethylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 131-11-3 | Dimethylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 88-85-7 | Dinoseb | U | 10.2 | ug/L | 3.06 | 10.2 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468019** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 21:36** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **980 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1218.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 118-74-1 | Hexachlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 87-68-3 | Hexachlorobutadiene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 67-72-1 | Hexachloroethane | U | 10.2 | ug/L | 3.06 | 10.2 |
| 78-59-1 | Isophorone | U | 10.2 | ug/L | 3.57 | 10.2 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.2 | ug/L | 3.06 | 10.2 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 98-95-3 | Nitrobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 608-93-5 | Pentachlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 108-95-2 | Phenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 110-86-1 | Pyridine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.2 | ug/L | 3.06 | 10.2 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.2 | ug/L | 3.06 | 10.2 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.2 | ug/L | 3.06 | 10.2 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 65794-96-9 | m,p-Cresols | U | 10.2 | ug/L | 3.78 | 10.2 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.2 | ug/L | 3.06 | 10.2 |
| 95-48-7 | o-Cresol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.2 | ug/L | 3.06 | 10.2 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.2 | ug/L | 3.06 | 10.2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 63.6 | 102 | ug/L | 62.4 | (33%-126%) |
| 2-Fluorobiphenyl | 24.4 | 51.0 | ug/L | 47.8 | (35%-102%) |
| 2-Fluorophenol | 35.2 | 102 | ug/L | 34.5 | (18%-84%) |
| Nitrobenzene-d5 | 27.3 | 51.0 | ug/L | 53.5 | (38%-113%) |
| Phenol-d5 | 21.6 | 102 | ug/L | 21.2 | (10%-110%) |
| p-Terphenyl-d14 | 30.0 | 51.0 | ug/L | 58.8 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000067-66-3 | Trichloromethane | 2.208 | 27.9 | ug/L | 93 | NJ |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468019** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 21:36** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **980 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1218.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.438 | 6.98 | ug/L | 0 | J |
| | unknown | 3.064 | 21.4 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468024** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 22:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1219.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 122-66-7 | Azobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 123-91-1 | 1,4-Dioxane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.8 | ug/L | 5.21 | 20.8 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.04 | ug/L | 0.427 | 1.04 |
| 95-57-8 | 2-Chlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-75-5 | 2-Nitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 59-50-7 | Parachlorometa cresol | U | 10.4 | ug/L | 3.13 | 10.4 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.4 | ug/L | 3.44 | 10.4 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 100-02-7 | 4-Nitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 62-53-3 | Aniline | U | 10.4 | ug/L | 4.38 | 10.4 |
| 1912-24-9 | Atrazine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 92-87-5 | Benzidine | U | 10.4 | ug/L | 4.06 | 10.4 |
| 65-85-0 | Benzoic acid | U | 20.8 | ug/L | 6.25 | 20.8 |
| 100-51-6 | Benzyl alcohol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 85-68-7 | Butylbenzylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 84-74-2 | Di-n-butylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 117-84-0 | Di-n-octylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 132-64-9 | Dibenzofuran | U | 10.4 | ug/L | 3.13 | 10.4 |
| 84-66-2 | Diethylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 131-11-3 | Dimethylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-85-7 | Dinoseb | U | 10.4 | ug/L | 3.13 | 10.4 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468024** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 22:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1219.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 118-74-1 | Hexachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 87-68-3 | Hexachlorobutadiene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 67-72-1 | Hexachloroethane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 78-59-1 | Isophorone | U | 10.4 | ug/L | 3.65 | 10.4 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 98-95-3 | Nitrobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 608-93-5 | Pentachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 108-95-2 | Phenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 110-86-1 | Pyridine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 65794-96-9 | m,p-Cresols | U | 10.4 | ug/L | 3.85 | 10.4 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-48-7 | o-Cresol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 77.4 | 104 | ug/L | 74.3 | (33%-126%) |
| 2-Fluorobiphenyl | 34.1 | 52.1 | ug/L | 65.4 | (35%-102%) |
| 2-Fluorophenol | 48.7 | 104 | ug/L | 46.7 | (18%-84%) |
| Nitrobenzene-d5 | 39.2 | 52.1 | ug/L | 75.2 | (38%-113%) |
| Phenol-d5 | 30.7 | 104 | ug/L | 29.4 | (10%-110%) |
| p-Terphenyl-d14 | 39.0 | 52.1 | ug/L | 74.9 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000067-66-3 | Trichloromethane | 2.192 | 29.5 | ug/L | 94 | NJ |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468024** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 22:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1219.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.432 | 8.82 | ug/L | 0 | J |
| | unknown | 3.047 | 13.8 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468029** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 22:40** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **980 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1220.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 122-66-7 | Azobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 123-91-1 | 1,4-Dioxane | U | 10.2 | ug/L | 3.06 | 10.2 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.4 | ug/L | 5.10 | 20.4 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.02 | ug/L | 0.418 | 1.02 |
| 95-57-8 | 2-Chlorophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 88-75-5 | 2-Nitrophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.2 | ug/L | 3.06 | 10.2 |
| 59-50-7 | Parachlorometa cresol | U | 10.2 | ug/L | 3.06 | 10.2 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.2 | ug/L | 3.37 | 10.2 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.2 | ug/L | 3.06 | 10.2 |
| 100-02-7 | 4-Nitrophenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 62-53-3 | Aniline | U | 10.2 | ug/L | 4.29 | 10.2 |
| 1912-24-9 | Atrazine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 92-87-5 | Benzidine | U | 10.2 | ug/L | 3.98 | 10.2 |
| 65-85-0 | Benzoic acid | U | 20.4 | ug/L | 6.12 | 20.4 |
| 100-51-6 | Benzyl alcohol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 85-68-7 | Butylbenzylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 84-74-2 | Di-n-butylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 117-84-0 | Di-n-octylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 132-64-9 | Dibenzofuran | U | 10.2 | ug/L | 3.06 | 10.2 |
| 84-66-2 | Diethylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 131-11-3 | Dimethylphthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 88-85-7 | Dinoseb | U | 10.2 | ug/L | 3.06 | 10.2 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468029** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 22:40** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **980 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1220.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 118-74-1 | Hexachlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 87-68-3 | Hexachlorobutadiene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 67-72-1 | Hexachloroethane | U | 10.2 | ug/L | 3.06 | 10.2 |
| 78-59-1 | Isophorone | U | 10.2 | ug/L | 3.57 | 10.2 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.2 | ug/L | 3.06 | 10.2 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 98-95-3 | Nitrobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 608-93-5 | Pentachlorobenzene | U | 10.2 | ug/L | 3.06 | 10.2 |
| 108-95-2 | Phenol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 110-86-1 | Pyridine | U | 10.2 | ug/L | 3.06 | 10.2 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.2 | ug/L | 3.06 | 10.2 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.2 | ug/L | 3.06 | 10.2 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.2 | ug/L | 3.06 | 10.2 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.2 | ug/L | 3.06 | 10.2 |
| 65794-96-9 | m,p-Cresols | U | 10.2 | ug/L | 3.78 | 10.2 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.2 | ug/L | 3.06 | 10.2 |
| 95-48-7 | o-Cresol | U | 10.2 | ug/L | 3.06 | 10.2 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.2 | ug/L | 3.06 | 10.2 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.2 | ug/L | 3.06 | 10.2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 59.8 | 102 | ug/L | 58.6 | (33%-126%) |
| 2-Fluorobiphenyl | 23.5 | 51.0 | ug/L | 46.0 | (35%-102%) |
| 2-Fluorophenol | 36.0 | 102 | ug/L | 35.3 | (18%-84%) |
| Nitrobenzene-d5 | 27.0 | 51.0 | ug/L | 53.0 | (38%-113%) |
| Phenol-d5 | 23.0 | 102 | ug/L | 22.5 | (10%-110%) |
| p-Terphenyl-d14 | 25.6 | 51.0 | ug/L | 50.2 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000067-66-3 | Trichloromethane | 2.203 | 32.9 | ug/L | 90 | NJ |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468029** | **Date Received:** | **10/08/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 22:40** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **980 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1220.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.438 | 8.78 | ug/L | 0 | J |

# Quality Control Summary

**Semi-Volatile**

## Surrogate Recovery Report

**SDG Number: 2015-40**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 2FP %REC | PHL %REC | NBZ %REC | FBP %REC | TBP %REC | TPH %REC |
|---|---|---|---|---|---|---|---|
| 1203184271 | MB for batch 1425971 | 38 | 25 | 66 | 59 | 58 | 59 |
| 1203184272 | LCS for batch 1425971 | 40 | 25 | 59 | 58 | 65 | 62 |
| 358468012 | CAWR-14-86939 | 29 | 20 | 65 | 59 | 13 * | 57 |
| 1203184273 | CAWR-14-86939MS | 57 | 50 | 73 | 75 | 73 | 64 |
| 1203184274 | CAWR-14-86939MSD | 51 | 41 | 58 | 57 | 63 | 50 |
| 358468019 | CAWR-14-86874 | 35 | 21 | 54 | 48 | 62 | 59 |
| 358468024 | CAWR-14-86875 | 47 | 29 | 75 | 65 | 74 | 75 |
| 358468029 | CAWR-14-86880 | 35 | 23 | 53 | 46 | 59 | 50 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 2FP | = 2-Fluorophenol | (18%-84%) |
| PHL | = Phenol-d5 | (10%-110%) |
| NBZ | = Nitrobenzene-d5 | (38%-113%) |
| FBP | = 2-Fluorobiphenyl | (35%-102%) |
| TBP | = 2,4,6-Tribromophenol | (33%-126%) |
| TPH | = p-Terphenyl-d14 | (38%-123%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1425971**
**Lab Sample ID** **1203184272**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/12/2014 14:40**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 62-75-9 | LCS | N-Methyl-N-nitrosomethylam | 50.0 | 0.0 | 24.5 | 49 | 24-82 |
| 110-86-1 | LCS | Pyridine | 50.0 | 0.0 | 29.1 | 58 | 24-97 |
| 62-53-3 | LCS | Aniline | 50.0 | 0.0 | 37.7 | 75 | 42-120 |
| 108-95-2 | LCS | Phenol | 50.0 | 0.0 | 13.5 | 27 | 10-114 |
| 111-44-4 | LCS | bis(2-Chloroethyl) ether | 50.0 | 0.0 | 28.8 | 58 | 44-111 |
| 95-57-8 | LCS | 2-Chlorophenol | 50.0 | 0.0 | 29.4 | 59 | 44-103 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 18.3 | 37 | 27-91 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 18.9 | 38 | 27-93 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 19.3 | 39 | 29-92 |
| 108-60-1 | LCS | bis(2-Chloro-1-methylethyl)et | 50.0 | 0.0 | 22.4 | 45 | 30-113 |
| 100-51-6 | LCS | Benzyl alcohol | 50.0 | 0.0 | 29.8 | 60 | 34-106 |
| 95-48-7 | LCS | o-Cresol | 50.0 | 0.0 | 26.9 | 54 | 36-99 |
| 65794-96-9 | LCS | m,p-Cresols | 50.0 | 0.0 | 27.7 | 55 | 34-106 |
| 621-64-7 | LCS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 50.0 | 0.0 | 30.0 | 60 | 48-119 |
| 67-72-1 | LCS | Hexachloroethane | 50.0 | 0.0 | 16.9 | 34 | 25-92 |
| 98-95-3 | LCS | Nitrobenzene | 50.0 | 0.0 | 28.3 | 57 | 44-117 |
| 78-59-1 | LCS | Isophorone | 50.0 | 0.0 | 31.5 | 63 | 49-124 |
| 88-75-5 | LCS | 2-Nitrophenol | 50.0 | 0.0 | 28.6 | 57 | 47-110 |
| 105-67-9 | LCS | 2,4-Dimethylphenol | 50.0 | 0.0 | 27.2 | 54 | 43-105 |
| 111-91-1 | LCS | bis(2-Chloroethoxy)methane | 50.0 | 0.0 | 29.9 | 60 | 48-114 |
| 120-83-2 | LCS | 2,4-Dichlorophenol | 50.0 | 0.0 | 29.1 | 58 | 47-107 |
| 65-85-0 | LCS | Benzoic acid | 100 | 0.0 | 24.6 | 25 | 10-91 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1425971**
**Lab Sample ID** **1203184272**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/12/2014 14:40**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-47-8 | LCS | 4-Chloroaniline | 50.0 | 0.0 | 36.0 | 72 | 48-120 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 17.9 | 36 | 24-93 |
| 59-50-7 | LCS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 50.0 | 0.0 | 29.6 | 59 | 47-113 |
| 77-47-4 | LCS | Hexachlorocyclopentadiene | 50.0 | 0.0 | 20.7 | 41 | 18-87 |
| 88-06-2 | LCS | 2,4,6-Trichlorophenol | 50.0 | 0.0 | 29.7 | 59 | 48-114 |
| 95-95-4 | LCS | 2,4,5-Trichlorophenol | 50.0 | 0.0 | 28.8 | 58 | 50-113 |
| 91-58-7 | LCS | 2-Chloronaphthalene | 50.0 | 0.0 | 24.4 | 49 | 37-100 |
| 88-74-4 | LCS | 2-Nitroaniline<br>*o-Nitroaniline* | 50.0 | 0.0 | 31.5 | 63 | 50-123 |
| 99-09-2 | LCS | 3-Nitroaniline<br>*m-Nitroaniline* | 50.0 | 0.0 | 35.1 | 70 | 48-126 |
| 131-11-3 | LCS | Dimethylphthalate | 50.0 | 0.0 | 33.9 | 68 | 55-119 |
| 606-20-2 | LCS | 2,6-Dinitrotoluene | 50.0 | 0.0 | 32.4 | 65 | 55-117 |
| 121-14-2 | LCS | 2,4-Dinitrotoluene | 50.0 | 0.0 | 32.9 | 66 | 55-123 |
| 51-28-5 | LCS | 2,4-Dinitrophenol | 50.0 | 0.0 | 27.0 | 54 | 14-126 |
| 132-64-9 | LCS | Dibenzofuran | 50.0 | 0.0 | 28.9 | 58 | 46-111 |
| 58-90-2 | LCS | 2,3,4,6-Tetrachlorophenol | 50.0 | 0.0 | 31.5 | 63 | 48-117 |
| 84-66-2 | LCS | Diethylphthalate | 50.0 | 0.0 | 34.0 | 68 | 55-121 |
| 100-02-7 | LCS | 4-Nitrophenol | 50.0 | 0.0 | 10.3 | 21 | 15-109 |
| 7005-72-3 | LCS | 4-Chlorophenylphenylether | 50.0 | 0.0 | 29.1 | 58 | 44-112 |
| 100-01-6 | LCS | 4-Nitroaniline<br>*p-Nitroaniline* | 50.0 | 0.0 | 37.2 | 74 | 46-144 |
| 534-52-1 | LCS | 2-Methyl-4,6-dinitrophenol | 50.0 | 0.0 | 35.3 | 71 | 41-123 |
| 122-39-4 | LCS | Diphenylamine | 50.0 | 0.0 | 35.3 | 71 | 51-111 |
| 122-66-7 | LCS | Azobenzene<br>*1,2-Diphenylhydrazine* | 50.0 | 0.0 | 32.2 | 64 | 43-114 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1425971**
**Lab Sample ID** **1203184272**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/12/2014 14:40**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 101-55-3 | LCS | 4-Bromophenylphenylether | 50.0 | 0.0 | 33.2 | 66 | 46-112 |
| 118-74-1 | LCS | Hexachlorobenzene | 50.0 | 0.0 | 36.1 | 72 | 46-113 |
| 84-74-2 | LCS | Di-n-butylphthalate | 50.0 | 0.0 | 35.7 | 71 | 52-119 |
| 85-68-7 | LCS | Butylbenzylphthalate | 50.0 | 0.0 | 33.6 | 67 | 45-121 |
| 117-81-7 | LCS | bis(2-Ethylhexyl)phthalate | 50.0 | 0.0 | 32.3 | 65 | 43-120 |
| 117-84-0 | LCS | Di-n-octylphthalate | 50.0 | 0.0 | 32.8 | 66 | 40-122 |
| 123-91-1 | LCS | 1,4-Dioxane | 50.0 | 0.0 | 23.2 | 46 | 29-74 |
| 930-55-2 | LCS | N-Nitrosopyrrolidine | 50.0 | 0.0 | 34.3 | 69 | 46-111 |
| 95-94-3 | LCS | 1,2,4,5-Tetrachlorobenzene | 50.0 | 0.0 | 22.5 | 45 | 33-94 |
| 1912-24-9 | LCS | Atrazine | 50.0 | 0.0 | 42.3 | 85 | 30-122 |
| 92-87-5 | LCS | Benzidine | 100 | 0.0 | 33.9 | 34 | 10-137 |
| 91-94-1 | LCS | 3,3'-Dichlorobenzidine | 50.0 | 0.0 | 34.9 | 70 | 37-119 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 20.5 | 41 | 29-93 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **CAWR-14-86939MS**
**Lab Sample ID** **1203184273**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/12/2014 20:32**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MS | N-Methyl-N-nitrosomethylam | 111 | 0.00 | U | 84.1 | 76 | 26-97 |
| 110-86-1 | MS | Pyridine | 111 | 0.00 | U | 74.5 | 67 | 20-112 |
| 62-53-3 | MS | Aniline | 111 | 0.00 | U | 102 | 92 | 28-126 |
| 108-95-2 | MS | Phenol | 111 | 0.00 | U | 56.6 | 51 | 17-77 |
| 111-44-4 | MS | bis(2-Chloroethyl) ether | 111 | 0.00 | U | 78.2 | 70 | 37-113 |
| 95-57-8 | MS | 2-Chlorophenol | 111 | 0.00 | U | 73.5 | 66 | 34-108 |
| 541-73-1 | MS | 1,3-Dichlorobenzene | 111 | 0.00 | U | 46.2 | 42 | 25-89 |
| 106-46-7 | MS | 1,4-Dichlorobenzene | 111 | 0.00 | U | 48.8 | 44 | 26-90 |
| 95-50-1 | MS | 1,2-Dichlorobenzene | 111 | 0.00 | U | 50.2 | 45 | 26-92 |
| 108-60-1 | MS | bis(2-Chloro-1-methylethyl)et | 111 | 0.00 | U | 63.8 | 57 | 26-114 |
| 100-51-6 | MS | Benzyl alcohol | 111 | 0.00 | U | 93.5 | 84 | 28-119 |
| 95-48-7 | MS | o-Cresol | 111 | 0.00 | U | 78.6 | 71 | 30-108 |
| 65794-96-9 | MS | m,p-Cresols | 111 | 0.00 | U | 85.6 | 77 | 31-119 |
| 621-64-7 | MS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 111 | 0.00 | U | 81.6 | 73 | 40-122 |
| 67-72-1 | MS | Hexachloroethane | 111 | 0.00 | U | 39.8 | 36 | 23-89 |
| 98-95-3 | MS | Nitrobenzene | 111 | 0.00 | U | 76.6 | 69 | 38-123 |
| 78-59-1 | MS | Isophorone | 111 | 0.00 | U | 82.4 | 74 | 40-127 |
| 88-75-5 | MS | 2-Nitrophenol | 111 | 0.00 | U | 74.0 | 67 | 35-116 |
| 105-67-9 | MS | 2,4-Dimethylphenol | 111 | 0.00 | U | 71.9 | 65 | 34-109 |
| 111-91-1 | MS | bis(2-Chloroethoxy)methane | 111 | 0.00 | U | 80.2 | 72 | 41-116 |
| 120-83-2 | MS | 2,4-Dichlorophenol | 111 | 0.00 | U | 71.2 | 64 | 35-113 |
| 65-85-0 | MS | Benzoic acid | 222 | 0.00 | U | 96.0 | 43 | 12-94 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **CAWR-14-86939MS**
**Lab Sample ID** **1203184273**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/12/2014 20:32**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MS | 4-Chloroaniline | 111 | 0.00 | U | 97.8 | 88 | 32-122 |
| 87-68-3 | MS | Hexachlorobutadiene | 111 | 0.00 | U | 44.0 | 40 | 23-90 |
| 59-50-7 | MS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 111 | 0.00 | U | 83.0 | 75 | 37-119 |
| 77-47-4 | MS | Hexachlorocyclopentadiene | 111 | 0.00 | U | 63.6 | 57 | 10-84 |
| 88-06-2 | MS | 2,4,6-Trichlorophenol | 111 | 0.00 | U | 59.6 | 54 | 36-120 |
| 95-95-4 | MS | 2,4,5-Trichlorophenol | 111 | 0.00 | U | 70.9 | 64 | 37-121 |
| 91-58-7 | MS | 2-Chloronaphthalene | 111 | 0.00 | U | 68.0 | 61 | 32-103 |
| 88-74-4 | MS | 2-Nitroaniline<br>*o-Nitroaniline* | 111 | 0.00 | U | 97.6 | 88 | 38-126 |
| 99-09-2 | MS | 3-Nitroaniline<br>*m-Nitroaniline* | 111 | 0.00 | U | 118 | 106 | 30-131 |
| 131-11-3 | MS | Dimethylphthalate | 111 | 0.00 | U | 97.0 | 87 | 45-121 |
| 606-20-2 | MS | 2,6-Dinitrotoluene | 111 | 0.00 | U | 93.8 | 84 | 44-120 |
| 121-14-2 | MS | 2,4-Dinitrotoluene | 111 | 0.00 | U | 102 | 92 | 44-127 |
| 51-28-5 | MS | 2,4-Dinitrophenol | 111 | 0.00 | U | 53.5 | 48 | 10-133 |
| 132-64-9 | MS | Dibenzofuran | 111 | 0.00 | U | 81.4 | 73 | 39-114 |
| 58-90-2 | MS | 2,3,4,6-Tetrachlorophenol | 111 | 0.00 | U | 58.5 | 53 | 34-125 |
| 84-66-2 | MS | Diethylphthalate | 111 | 0.00 | U | 95.1 | 86 | 44-124 |
| 100-02-7 | MS | 4-Nitrophenol | 111 | 0.00 | U | 50.1 | 45 | 10-83 |
| 7005-72-3 | MS | 4-Chlorophenylphenylether | 111 | 0.00 | U | 81.7 | 74 | 37-112 |
| 100-01-6 | MS | 4-Nitroaniline<br>*p-Nitroaniline* | 111 | 0.00 | U | 131 | 118 | 27-149 |
| 534-52-1 | MS | 2-Methyl-4,6-dinitrophenol | 111 | 0.00 | U | 61.9 | 56 | 28-131 |
| 122-39-4 | MS | Diphenylamine | 111 | 0.00 | U | 75.5 | 68 | 34-117 |
| 122-66-7 | MS | Azobenzene<br>*1,2-Diphenylhydrazine* | 111 | 0.00 | U | 81.4 | 73 | 36-115 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **CAWR-14-86939MS**
**Lab Sample ID** **1203184273**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/12/2014 20:32**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MS | 4-Bromophenylphenylether | 111 | 0.00 | U | 85.0 | 77 | 39-112 |
| 118-74-1 | MS | Hexachlorobenzene | 111 | 0.00 | U | 88.5 | 80 | 39-114 |
| 84-74-2 | MS | Di-n-butylphthalate | 111 | 0.00 | U | 93.2 | 84 | 40-122 |
| 85-68-7 | MS | Butylbenzylphthalate | 111 | 0.00 | U | 84.2 | 76 | 36-124 |
| 117-81-7 | MS | bis(2-Ethylhexyl)phthalate | 111 | 0.00 | U | 84.1 | 76 | 35-123 |
| 117-84-0 | MS | Di-n-octylphthalate | 111 | 0.00 | U | 88.6 | 80 | 32-124 |
| 123-91-1 | MS | 1,4-Dioxane | 111 | 0.00 | U | 76.5 | 69 | 27-94 |
| 930-55-2 | MS | N-Nitrosopyrrolidine | 111 | 0.00 | U | 94.3 | 85 | 43-117 |
| 95-94-3 | MS | 1,2,4,5-Tetrachlorobenzene | 111 | 0.00 | U | 61.4 | 55 | 28-96 |
| 1912-24-9 | MS | Atrazine | 111 | 0.00 | U | 116 | 105 | 18-119 |
| 92-87-5 | MS | Benzidine | 222 | 0.00 | U | 31.3 | 14 | 10-127 |
| 91-94-1 | MS | 3,3'-Dichlorobenzidine | 111 | 0.00 | U | 99.6 | 90 | 19-120 |
| 120-82-1 | MS | 1,2,4-Trichlorobenzene | 111 | 0.00 | U | 55.9 | 50 | 26-92 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **CAWR-14-86939MSD**
**Lab Sample ID** **1203184274**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/12/2014 21:04**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MSD | N-Methyl-N-nitrosomethylam | 111 | 0.00 | U | 71.5 | 64 | 26-97 | 16 | 0-30 |
| 110-86-1 | MSD | Pyridine | 111 | 0.00 | U | 50.7 | 46 | 20-112 | 38 * | 0-30 |
| 62-53-3 | MSD | Aniline | 111 | 0.00 | U | 80.9 | 73 | 28-126 | 23 | 0-30 |
| 108-95-2 | MSD | Phenol | 111 | 0.00 | U | 48.6 | 44 | 17-77 | 15 | 0-30 |
| 111-44-4 | MSD | bis(2-Chloroethyl) ether | 111 | 0.00 | U | 63.4 | 57 | 37-113 | 21 | 0-30 |
| 95-57-8 | MSD | 2-Chlorophenol | 111 | 0.00 | U | 63.6 | 57 | 34-108 | 15 | 0-30 |
| 541-73-1 | MSD | 1,3-Dichlorobenzene | 111 | 0.00 | U | 40.2 | 36 | 25-89 | 14 | 0-30 |
| 106-46-7 | MSD | 1,4-Dichlorobenzene | 111 | 0.00 | U | 41.3 | 37 | 26-90 | 17 | 0-30 |
| 95-50-1 | MSD | 1,2-Dichlorobenzene | 111 | 0.00 | U | 42.7 | 38 | 26-92 | 16 | 0-30 |
| 108-60-1 | MSD | bis(2-Chloro-1-methylethyl)et | 111 | 0.00 | U | 52.3 | 47 | 26-114 | 20 | 0-30 |
| 100-51-6 | MSD | Benzyl alcohol | 111 | 0.00 | U | 76.4 | 69 | 28-119 | 20 | 0-30 |
| 95-48-7 | MSD | o-Cresol | 111 | 0.00 | U | 64.2 | 58 | 30-108 | 20 | 0-30 |
| 65794-96-9 | MSD | m,p-Cresols | 111 | 0.00 | U | 72.8 | 66 | 31-119 | 16 | 0-30 |
| 621-64-7 | MSD | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 111 | 0.00 | U | 65.1 | 59 | 40-122 | 23 | 0-30 |
| 67-72-1 | MSD | Hexachloroethane | 111 | 0.00 | U | 35.7 | 32 | 23-89 | 11 | 0-30 |
| 98-95-3 | MSD | Nitrobenzene | 111 | 0.00 | U | 64.4 | 58 | 38-123 | 17 | 0-30 |
| 78-59-1 | MSD | Isophorone | 111 | 0.00 | U | 67.6 | 61 | 40-127 | 20 | 0-30 |
| 88-75-5 | MSD | 2-Nitrophenol | 111 | 0.00 | U | 65.8 | 59 | 35-116 | 12 | 0-30 |
| 105-67-9 | MSD | 2,4-Dimethylphenol | 111 | 0.00 | U | 58.3 | 53 | 34-109 | 21 | 0-30 |
| 111-91-1 | MSD | bis(2-Chloroethoxy)methane | 111 | 0.00 | U | 65.6 | 59 | 41-116 | 20 | 0-30 |
| 120-83-2 | MSD | 2,4-Dichlorophenol | 111 | 0.00 | U | 63.1 | 57 | 35-113 | 12 | 0-30 |
| 65-85-0 | MSD | Benzoic acid | 222 | 0.00 | U | 94.6 | 43 | 12-94 | 1 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **CAWR-14-86939MSD**
**Lab Sample ID** **1203184274**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/12/2014 21:04**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MSD | 4-Chloroaniline | 111 | 0.00 | U | 84.4 | 76 | 32-122 | 15 | 0-30 |
| 87-68-3 | MSD | Hexachlorobutadiene | 111 | 0.00 | U | 38.1 | 34 | 23-90 | 14 | 0-30 |
| 59-50-7 | MSD | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 111 | 0.00 | U | 68.2 | 61 | 37-119 | 20 | 0-30 |
| 77-47-4 | MSD | Hexachlorocyclopentadiene | 111 | 0.00 | U | 48.8 | 44 | 10-84 | 26 | 0-30 |
| 88-06-2 | MSD | 2,4,6-Trichlorophenol | 111 | 0.00 | U | 60.3 | 54 | 36-120 | 1 | 0-30 |
| 95-95-4 | MSD | 2,4,5-Trichlorophenol | 111 | 0.00 | U | 63.0 | 57 | 37-121 | 12 | 0-30 |
| 91-58-7 | MSD | 2-Chloronaphthalene | 111 | 0.00 | U | 53.2 | 48 | 32-103 | 25 | 0-30 |
| 88-74-4 | MSD | 2-Nitroaniline<br>*o-Nitroaniline* | 111 | 0.00 | U | 75.5 | 68 | 38-126 | 26 | 0-30 |
| 99-09-2 | MSD | 3-Nitroaniline<br>*m-Nitroaniline* | 111 | 0.00 | U | 91.8 | 83 | 30-131 | 25 | 0-30 |
| 131-11-3 | MSD | Dimethylphthalate | 111 | 0.00 | U | 73.3 | 66 | 45-121 | 28 | 0-30 |
| 606-20-2 | MSD | 2,6-Dinitrotoluene | 111 | 0.00 | U | 72.5 | 65 | 44-120 | 26 | 0-30 |
| 121-14-2 | MSD | 2,4-Dinitrotoluene | 111 | 0.00 | U | 77.0 | 69 | 44-127 | 28 | 0-30 |
| 51-28-5 | MSD | 2,4-Dinitrophenol | 111 | 0.00 | U | 62.0 | 56 | 10-133 | 15 | 0-30 |
| 132-64-9 | MSD | Dibenzofuran | 111 | 0.00 | U | 62.4 | 56 | 39-114 | 27 | 0-30 |
| 58-90-2 | MSD | 2,3,4,6-Tetrachlorophenol | 111 | 0.00 | U | 62.5 | 56 | 34-125 | 7 | 0-30 |
| 84-66-2 | MSD | Diethylphthalate | 111 | 0.00 | U | 72.5 | 65 | 44-124 | 27 | 0-30 |
| 100-02-7 | MSD | 4-Nitrophenol | 111 | 0.00 | U | 47.4 | 43 | 10-83 | 5 | 0-30 |
| 7005-72-3 | MSD | 4-Chlorophenylphenylether | 111 | 0.00 | U | 62.4 | 56 | 37-112 | 27 | 0-30 |
| 100-01-6 | MSD | 4-Nitroaniline<br>*p-Nitroaniline* | 111 | 0.00 | U | 97.8 | 88 | 27-149 | 29 | 0-30 |
| 534-52-1 | MSD | 2-Methyl-4,6-dinitrophenol | 111 | 0.00 | U | 72.4 | 65 | 28-131 | 16 | 0-30 |
| 122-39-4 | MSD | Diphenylamine | 111 | 0.00 | U | 59.1 | 53 | 34-117 | 24 | 0-30 |
| 122-66-7 | MSD | Azobenzene<br>*1,2-Diphenylhydrazine* | 111 | 0.00 | U | 63.7 | 57 | 36-115 | 24 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **CAWR-14-86939MSD**
**Lab Sample ID** **1203184274**
**Instrument:** **MSD8.I**
**Analyst:** **AGS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **10/12/2014 21:04**
**Prep Batch ID:** **1425971**
**Batch ID:** **1425972**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MSD | 4-Bromophenylphenylether | 111 | 0.00 | U | 67.9 | 61 | 39-112 | 22 | 0-30 |
| 118-74-1 | MSD | Hexachlorobenzene | 111 | 0.00 | U | 70.2 | 63 | 39-114 | 23 | 0-30 |
| 84-74-2 | MSD | Di-n-butylphthalate | 111 | 0.00 | U | 73.4 | 66 | 40-122 | 24 | 0-30 |
| 85-68-7 | MSD | Butylbenzylphthalate | 111 | 0.00 | U | 67.0 | 60 | 36-124 | 23 | 0-30 |
| 117-81-7 | MSD | bis(2-Ethylhexyl)phthalate | 111 | 0.00 | U | 67.9 | 61 | 35-123 | 21 | 0-30 |
| 117-84-0 | MSD | Di-n-octylphthalate | 111 | 0.00 | U | 71.8 | 65 | 32-124 | 21 | 0-30 |
| 123-91-1 | MSD | 1,4-Dioxane | 111 | 0.00 | U | 67.6 | 61 | 27-94 | 12 | 0-30 |
| 930-55-2 | MSD | N-Nitrosopyrrolidine | 111 | 0.00 | U | 77.0 | 69 | 43-117 | 20 | 0-30 |
| 95-94-3 | MSD | 1,2,4,5-Tetrachlorobenzene | 111 | 0.00 | U | 48.2 | 43 | 28-96 | 24 | 0-30 |
| 1912-24-9 | MSD | Atrazine | 111 | 0.00 | U | 90.2 | 81 | 18-119 | 25 | 0-30 |
| 92-87-5 | MSD | Benzidine | 222 | 0.00 | U | 11.5 | 5 * | 10-127 | 93 * | 0-30 |
| 91-94-1 | MSD | 3,3'-Dichlorobenzidine | 111 | 0.00 | U | 74.2 | 67 | 19-120 | 29 | 0-30 |
| 120-82-1 | MSD | 1,2,4-Trichlorobenzene | 111 | 0.00 | U | 46.3 | 42 | 26-92 | 19 | 0-30 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1425971** | **Instrument ID:** | **MSD8.I** | **Data File:** | **s101214.B\s8J1204.D** |
| **Lab Sample ID:** | **1203184271** | **Prep Date:** | **10/10/2014 06:25** | **Analyzed:** | **10/12/14 14:08** |
| **Column:** | **DB-5ms** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1425971 | 1203184272 | s101214.B\s8J1205.D | 10/12/14 | 1440 |
| 02 CAWR-14-86939 | 358468012 | s101214.B\s8J1215.D | 10/12/14 | 2000 |
| 03 CAWR-14-86939MS | 1203184273 | s101214.B\s8J1216.D | 10/12/14 | 2032 |
| 04 CAWR-14-86939MSD | 1203184274 | s101214.B\s8J1217.D | 10/12/14 | 2104 |
| 05 CAWR-14-86874 | 358468019 | s101214.B\s8J1218.D | 10/12/14 | 2136 |
| 06 CAWR-14-86875 | 358468024 | s101214.B\s8J1219.D | 10/12/14 | 2208 |
| 07 CAWR-14-86880 | 358468029 | s101214.B\s8J1220.D | 10/12/14 | 2240 |

# Quality Control Data

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203184271** | | | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1425971** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 14:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1204.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203184271** | | | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1425971** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 14:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1204.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 118-74-1 | Hexachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 57.6 | 100 | ug/L | 57.6 | (33%-126%) |
| 2-Fluorobiphenyl | 29.4 | 50.0 | ug/L | 58.7 | (35%-102%) |
| 2-Fluorophenol | 38.1 | 100 | ug/L | 38.1 | (18%-84%) |
| Nitrobenzene-d5 | 32.8 | 50.0 | ug/L | 65.7 | (38%-113%) |
| Phenol-d5 | 24.6 | 100 | ug/L | 24.6 | (10%-110%) |
| p-Terphenyl-d14 | 29.4 | 50.0 | ug/L | 58.7 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000067-66-3 | Trichloromethane | 2.192 | 31.3 | ug/L | 94 | NJ |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203184271** | | | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1425971** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 14:08** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1204.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.432 | 12.4 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203184272** | | | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1425971** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 14:40** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1205.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 22.5 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 20.5 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 19.3 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | | 32.2 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 18.3 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 18.9 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | | 23.2 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 31.5 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 28.8 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 29.7 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 29.1 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 27.2 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 27.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 32.9 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 32.4 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | | 24.4 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | | 29.4 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 35.3 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | | 28.6 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 34.9 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 33.2 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | | 29.6 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 36.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 29.1 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | | 10.3 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | | 37.7 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | | 42.3 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | | 33.9 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | | 24.6 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | | 29.8 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | | 33.6 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | | 35.7 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | | 32.8 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | | 28.9 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | | 34.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | | 33.9 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203184272** | | | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1425971** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 14:40** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1205.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 35.3 | ug/L | 3.00 | 10.0 |
| 118-74-1 | Hexachlorobenzene | | 36.1 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | | 17.9 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 20.7 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | | 16.9 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | | 31.5 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 24.5 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 30.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 34.3 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | | 28.3 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | | 13.5 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | | 29.1 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 22.4 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 29.9 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 28.8 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 32.3 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | | 27.7 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 35.1 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | | 26.9 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 31.5 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 37.2 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 64.6 | 100 | ug/L | 64.6 | (33%-126%) |
| 2-Fluorobiphenyl | 29.2 | 50.0 | ug/L | 58.4 | (35%-102%) |
| 2-Fluorophenol | 40.4 | 100 | ug/L | 40.4 | (18%-84%) |
| Nitrobenzene-d5 | 29.3 | 50.0 | ug/L | 58.5 | (38%-113%) |
| Phenol-d5 | 24.8 | 100 | ug/L | 24.8 | (10%-110%) |
| p-Terphenyl-d14 | 31.0 | 50.0 | ug/L | 62.0 | (38%-123%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203184273** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86939MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 20:32** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **450 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1216.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 61.4 | ug/L | 6.67 | 22.2 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 55.9 | ug/L | 6.67 | 22.2 |
| 95-50-1 | 1,2-Dichlorobenzene | | 50.2 | ug/L | 6.67 | 22.2 |
| 122-66-7 | Azobenzene | | 81.4 | ug/L | 6.67 | 22.2 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 46.2 | ug/L | 6.67 | 22.2 |
| 106-46-7 | 1,4-Dichlorobenzene | | 48.8 | ug/L | 6.67 | 22.2 |
| 123-91-1 | 1,4-Dioxane | | 76.5 | ug/L | 6.67 | 22.2 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 58.5 | ug/L | 6.67 | 22.2 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 70.9 | ug/L | 6.67 | 22.2 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 59.6 | ug/L | 6.67 | 22.2 |
| 120-83-2 | 2,4-Dichlorophenol | | 71.2 | ug/L | 6.67 | 22.2 |
| 105-67-9 | 2,4-Dimethylphenol | | 71.9 | ug/L | 6.67 | 22.2 |
| 51-28-5 | 2,4-Dinitrophenol | | 53.5 | ug/L | 11.1 | 44.4 |
| 121-14-2 | 2,4-Dinitrotoluene | | 102 | ug/L | 6.67 | 22.2 |
| 606-20-2 | 2,6-Dinitrotoluene | | 93.8 | ug/L | 6.67 | 22.2 |
| 91-58-7 | 2-Chloronaphthalene | | 68.0 | ug/L | 0.911 | 2.22 |
| 95-57-8 | 2-Chlorophenol | | 73.5 | ug/L | 6.67 | 22.2 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 61.9 | ug/L | 6.67 | 22.2 |
| 88-75-5 | 2-Nitrophenol | | 74.0 | ug/L | 6.67 | 22.2 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 99.6 | ug/L | 6.67 | 22.2 |
| 101-55-3 | 4-Bromophenylphenylether | | 85.0 | ug/L | 6.67 | 22.2 |
| 59-50-7 | Parachlorometa cresol | | 83.0 | ug/L | 6.67 | 22.2 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 97.8 | ug/L | 7.33 | 22.2 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 81.7 | ug/L | 6.67 | 22.2 |
| 100-02-7 | 4-Nitrophenol | | 50.1 | ug/L | 6.67 | 22.2 |
| 62-53-3 | Aniline | | 102 | ug/L | 9.33 | 22.2 |
| 1912-24-9 | Atrazine | | 116 | ug/L | 6.67 | 22.2 |
| 92-87-5 | Benzidine | | 31.3 | ug/L | 8.67 | 22.2 |
| 65-85-0 | Benzoic acid | | 96.0 | ug/L | 13.3 | 44.4 |
| 100-51-6 | Benzyl alcohol | | 93.5 | ug/L | 6.67 | 22.2 |
| 85-68-7 | Butylbenzylphthalate | | 84.2 | ug/L | 6.67 | 22.2 |
| 84-74-2 | Di-n-butylphthalate | | 93.2 | ug/L | 6.67 | 22.2 |
| 117-84-0 | Di-n-octylphthalate | | 88.6 | ug/L | 6.67 | 22.2 |
| 132-64-9 | Dibenzofuran | | 81.4 | ug/L | 6.67 | 22.2 |
| 84-66-2 | Diethylphthalate | | 95.1 | ug/L | 6.67 | 22.2 |
| 131-11-3 | Dimethylphthalate | | 97.0 | ug/L | 6.67 | 22.2 |
| 88-85-7 | Dinoseb | U | 22.2 | ug/L | 6.67 | 22.2 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203184273** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86939MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 20:32** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **450 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1216.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 75.5 | ug/L | 6.67 | 22.2 |
| 118-74-1 | Hexachlorobenzene | | 88.5 | ug/L | 6.67 | 22.2 |
| 87-68-3 | Hexachlorobutadiene | | 44.0 | ug/L | 6.67 | 22.2 |
| 77-47-4 | Hexachlorocyclopentadiene | | 63.6 | ug/L | 6.67 | 22.2 |
| 67-72-1 | Hexachloroethane | | 39.8 | ug/L | 6.67 | 22.2 |
| 78-59-1 | Isophorone | | 82.4 | ug/L | 7.78 | 22.2 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 84.1 | ug/L | 6.67 | 22.2 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 22.2 | ug/L | 6.67 | 22.2 |
| 55-18-5 | N-Nitrosodiethylamine | U | 22.2 | ug/L | 6.67 | 22.2 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 81.6 | ug/L | 6.67 | 22.2 |
| 930-55-2 | N-Nitrosopyrrolidine | | 94.3 | ug/L | 6.67 | 22.2 |
| 98-95-3 | Nitrobenzene | | 76.6 | ug/L | 6.67 | 22.2 |
| 608-93-5 | Pentachlorobenzene | U | 22.2 | ug/L | 6.67 | 22.2 |
| 108-95-2 | Phenol | | 56.6 | ug/L | 6.67 | 22.2 |
| 110-86-1 | Pyridine | | 74.5 | ug/L | 6.67 | 22.2 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 63.8 | ug/L | 6.67 | 22.2 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 80.2 | ug/L | 6.67 | 22.2 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 78.2 | ug/L | 6.67 | 22.2 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 84.1 | ug/L | 6.67 | 22.2 |
| 65794-96-9 | m,p-Cresols | | 85.6 | ug/L | 8.22 | 22.2 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 118 | ug/L | 6.67 | 22.2 |
| 95-48-7 | o-Cresol | | 78.6 | ug/L | 6.67 | 22.2 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 97.6 | ug/L | 6.67 | 22.2 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 131 | ug/L | 6.67 | 22.2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 163 | 222 | ug/L | 73.5 | (33%-126%) |
| 2-Fluorobiphenyl | 83.6 | 111 | ug/L | 75.3 | (35%-102%) |
| 2-Fluorophenol | 128 | 222 | ug/L | 57.5 | (18%-84%) |
| Nitrobenzene-d5 | 80.7 | 111 | ug/L | 72.7 | (38%-113%) |
| Phenol-d5 | 111 | 222 | ug/L | 49.8 | (10%-110%) |
| p-Terphenyl-d14 | 71.5 | 111 | ug/L | 64.3 | (38%-123%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203184274** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86939MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 21:04** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **450 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1217.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 48.2 | ug/L | 6.67 | 22.2 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 46.3 | ug/L | 6.67 | 22.2 |
| 95-50-1 | 1,2-Dichlorobenzene | | 42.7 | ug/L | 6.67 | 22.2 |
| 122-66-7 | Azobenzene | | 63.7 | ug/L | 6.67 | 22.2 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 40.2 | ug/L | 6.67 | 22.2 |
| 106-46-7 | 1,4-Dichlorobenzene | | 41.3 | ug/L | 6.67 | 22.2 |
| 123-91-1 | 1,4-Dioxane | | 67.6 | ug/L | 6.67 | 22.2 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 62.5 | ug/L | 6.67 | 22.2 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 63.0 | ug/L | 6.67 | 22.2 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 60.3 | ug/L | 6.67 | 22.2 |
| 120-83-2 | 2,4-Dichlorophenol | | 63.1 | ug/L | 6.67 | 22.2 |
| 105-67-9 | 2,4-Dimethylphenol | | 58.3 | ug/L | 6.67 | 22.2 |
| 51-28-5 | 2,4-Dinitrophenol | | 62.0 | ug/L | 11.1 | 44.4 |
| 121-14-2 | 2,4-Dinitrotoluene | | 77.0 | ug/L | 6.67 | 22.2 |
| 606-20-2 | 2,6-Dinitrotoluene | | 72.5 | ug/L | 6.67 | 22.2 |
| 91-58-7 | 2-Chloronaphthalene | | 53.2 | ug/L | 0.911 | 2.22 |
| 95-57-8 | 2-Chlorophenol | | 63.6 | ug/L | 6.67 | 22.2 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 72.4 | ug/L | 6.67 | 22.2 |
| 88-75-5 | 2-Nitrophenol | | 65.8 | ug/L | 6.67 | 22.2 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 74.2 | ug/L | 6.67 | 22.2 |
| 101-55-3 | 4-Bromophenylphenylether | | 67.9 | ug/L | 6.67 | 22.2 |
| 59-50-7 | Parachlorometa cresol | | 68.2 | ug/L | 6.67 | 22.2 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 84.4 | ug/L | 7.33 | 22.2 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 62.4 | ug/L | 6.67 | 22.2 |
| 100-02-7 | 4-Nitrophenol | | 47.4 | ug/L | 6.67 | 22.2 |
| 62-53-3 | Aniline | | 80.9 | ug/L | 9.33 | 22.2 |
| 1912-24-9 | Atrazine | | 90.2 | ug/L | 6.67 | 22.2 |
| 92-87-5 | Benzidine | J | 11.5 | ug/L | 8.67 | 22.2 |
| 65-85-0 | Benzoic acid | | 94.6 | ug/L | 13.3 | 44.4 |
| 100-51-6 | Benzyl alcohol | | 76.4 | ug/L | 6.67 | 22.2 |
| 85-68-7 | Butylbenzylphthalate | | 67.0 | ug/L | 6.67 | 22.2 |
| 84-74-2 | Di-n-butylphthalate | | 73.4 | ug/L | 6.67 | 22.2 |
| 117-84-0 | Di-n-octylphthalate | | 71.8 | ug/L | 6.67 | 22.2 |
| 132-64-9 | Dibenzofuran | | 62.4 | ug/L | 6.67 | 22.2 |
| 84-66-2 | Diethylphthalate | | 72.5 | ug/L | 6.67 | 22.2 |
| 131-11-3 | Dimethylphthalate | | 73.3 | ug/L | 6.67 | 22.2 |
| 88-85-7 | Dinoseb | U | 22.2 | ug/L | 6.67 | 22.2 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203184274** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1425971** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86939MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1425972** | **Inst:** | **MSD8.I** | **Dilution:** | **1** |
| **Run Date:** | **10/12/2014 21:04** | **Analyst:** | **AGS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/10/2014 06:25** | **Aliquot:** | **450 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s101214.B\s8J1217.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 59.1 | ug/L | 6.67 | 22.2 |
| 118-74-1 | Hexachlorobenzene | | 70.2 | ug/L | 6.67 | 22.2 |
| 87-68-3 | Hexachlorobutadiene | | 38.1 | ug/L | 6.67 | 22.2 |
| 77-47-4 | Hexachlorocyclopentadiene | | 48.8 | ug/L | 6.67 | 22.2 |
| 67-72-1 | Hexachloroethane | | 35.7 | ug/L | 6.67 | 22.2 |
| 78-59-1 | Isophorone | | 67.6 | ug/L | 7.78 | 22.2 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 71.5 | ug/L | 6.67 | 22.2 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 22.2 | ug/L | 6.67 | 22.2 |
| 55-18-5 | N-Nitrosodiethylamine | U | 22.2 | ug/L | 6.67 | 22.2 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 65.1 | ug/L | 6.67 | 22.2 |
| 930-55-2 | N-Nitrosopyrrolidine | | 77.0 | ug/L | 6.67 | 22.2 |
| 98-95-3 | Nitrobenzene | | 64.4 | ug/L | 6.67 | 22.2 |
| 608-93-5 | Pentachlorobenzene | U | 22.2 | ug/L | 6.67 | 22.2 |
| 108-95-2 | Phenol | | 48.6 | ug/L | 6.67 | 22.2 |
| 110-86-1 | Pyridine | | 50.7 | ug/L | 6.67 | 22.2 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 52.3 | ug/L | 6.67 | 22.2 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 65.6 | ug/L | 6.67 | 22.2 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 63.4 | ug/L | 6.67 | 22.2 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 67.9 | ug/L | 6.67 | 22.2 |
| 65794-96-9 | m,p-Cresols | | 72.8 | ug/L | 8.22 | 22.2 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 91.8 | ug/L | 6.67 | 22.2 |
| 95-48-7 | o-Cresol | | 64.2 | ug/L | 6.67 | 22.2 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 75.5 | ug/L | 6.67 | 22.2 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 97.8 | ug/L | 6.67 | 22.2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 141 | 222 | ug/L | 63.4 | (33%-126%) |
| 2-Fluorobiphenyl | 63.4 | 111 | ug/L | 57.1 | (35%-102%) |
| 2-Fluorophenol | 114 | 222 | ug/L | 51.4 | (18%-84%) |
| Nitrobenzene-d5 | 64.2 | 111 | ug/L | 57.8 | (38%-113%) |
| Phenol-d5 | 90.9 | 222 | ug/L | 40.9 | (10%-110%) |
| p-Terphenyl-d14 | 55.3 | 111 | ug/L | 49.7 | (38%-123%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 13-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| SEMIVOA GC/MS | SW846 3510C/8270D | Liquid | ARSL(ESHL), OKEN, SCPO, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1425972 | See Below | | |

**Potentially affected work order(s)(SDG): 358371,358468(2015-40),358496,358577**

**Application Issues:**

Failed RPD for MS/MSD, or PS/PSD

Failed Yield for Surrogates

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Sample 358371045(SNLS) failed surrogate recovery. Please see the QC Summary/Surrogate Recovery Report for the specific recoveries. | 1. Sample 358371045 recovered the surrogates bias high. Target analytes were not detected in the sample. The data are considered unaffected and are reported. |
| 2. Sample 358468012(ARSL) failed surrogate recovery. Please see the QC Summary/Surrogate Recovery Report for the specific recoveries. | 2. The associated 1203184273MS and 1203184274MSD passed surrogate recovery. There is no more sample remaining to schedule a re-extraction. The data are reported. |
| 3. The 1203184274MSD recovered Benzidine at 5.16%. The limits are 10-127%. | 3. The associated MS passed Benzidine recovery just above the low limit. The LCS passed Benzidine recovery. The data are reported. |
| 4. The RPD values between the 1203184273MS and 1203184274MSD were not within the 0-30% limits for several analytes. Please see the QC Summary/Spike Recovery Report for the specific RPD values.<br><br>5. The RPD value between the 1203184275MS and 1203184276MSD was not within the 0-30% limits for 4-Nitrophenol. Please see the QC Summary/Spike Recovery Report for the specific RPD value.<br><br>6. The RPD values between the 1203184277MS and 1203184278MSD were not within the 0-30% limits for several analytes. Please see the QC Summary/Spike Recovery Report for the specific RPD values. | 4. ,5. & 6.The RPD failure is attributed to matrix interference. The data are reported. |

**Originator's Name:**

Lloyd O Fox 13-OCT-14

**Data Validator/Group Leader:**

Herbert Maier 15-OCT-14

# HPLC Polynuclear Aromatic Hydrocarbon Analysis

**HPLC-PAH**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Polynuclear Aromatic Hydrocarbons** |
| Analytical Method: | SW846 8310 |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1427006 |
| Prep Batch Number: | 1427003 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

| Sample ID | Client ID |
|---|---|
| 358468002 | CAWR-14-86935 |
| 358468009 | CAWR-14-86939 |
| 358468015 | CAWR-14-86874 |
| 358468021 | CAWR-14-86875 |
| 358468026 | CAWR-14-86880 |
| 1203186654 | MB for batch 1427003 |
| 1203186655 | Laboratory Control Sample (LCS) |
| 1203186672 | Laboratory Control Sample Duplicate (LCSD) |
| 1203186656 | 358468002(CAWR-14-86935) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

## Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**CCV Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPDs between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Client sample 358468002 (CAWR-14-86935) was chosen for matrix spike analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG except for dilutions.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

**Additional Comments**
The Form 8 is used only as a sequence of the analysis.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the analyst, reviewer, and report specialist names associated with the generation of the data and package. The data validator will always sign and date the case narrative.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

**Chromatographic Columns**

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 21 OCT 2014**  **Title: Group Leader**

# Roadmap for ARSL 2015-40 HPLC_PAH

This roadmap was analyzed by map on 10-17-2014, 09:07.
This roadmap was reviewed by map on 10-21-2014, 10:52.
This roadmap was packaged by map on 10-21-2014, 16:12.

Sample

| exclude | manual | datafile | smpid | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1607.d | 358468002 | 16-OCT-2014 | 18:13 | 2015-40.sub | CAWR-14-86935 | 1 | 1427006 | |
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1609.d | 358468009 | 16-OCT-2014 | 19:37 | 2015-40.sub | CAWR-14-86939 | 1 | 1427006 | |
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1610.d | 358468015 | 16-OCT-2014 | 20:20 | 2015-40.sub | CAWR-14-86874 | 1 | 1427006 | |
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1611.d | 358468021 | 16-OCT-2014 | 21:02 | 2015-40.sub | CAWR-14-86875 | 1 | 1427006 | |
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1612.d | 358468026 | 16-OCT-2014 | 21:44 | 2015-40.sub | CAWR-14-86880 | 1 | 1427006 | |

QC Sample

| exclude | manual | datafile | smpid | sampletype | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1604.d | 1203186654 | mb | 16-OCT-2014 | 16:06 | 2015-40.sub | PAHBLK01 | 1 | 1427006 | |
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1605.d | 1203186655 | lcs | 16-OCT-2014 | 16:49 | 2015-40.sub | PAHBLK01LCS | 1 | 1427006 | Pass |
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1608.d | 1203186656 | ms | 16-OCT-2014 | 18:55 | 2015-40.sub | CAWR-14-86935MS | 1 | 1427006 | Pass |
| ☐ | N | /chem/hplce.i/p101614.b/ph5j1606.d | 1203186672 | lcsd | 16-OCT-2014 | 17:31 | 2015-40.sub | PAHBLK01LCSD | 1 | 1427006 | Pass |

# Sample Data Summary

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468002** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86935** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 18:13** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1607.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.500 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.025 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | U | 0.500 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 160 | 250 | ug/L | 64.0 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468009** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 19:37** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1609.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.543 | ug/L | 0.237 | 0.543 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 83-32-9 | Acenaphthene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 208-96-8 | Acenaphthylene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 120-12-7 | Anthracene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.0272 | ug/L | 0.0087 | 0.0272 |
| 218-01-9 | Chrysene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 206-44-0 | Fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 86-73-7 | Fluorene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 91-20-3 | Naphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 85-01-8 | Phenanthrene | U | 0.543 | ug/L | 0.198 | 0.543 |
| 129-00-0 | Pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 131 | 272 | ug/L | 48.4 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468015** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 20:20** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1610.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.543 | ug/L | 0.237 | 0.543 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 83-32-9 | Acenaphthene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 208-96-8 | Acenaphthylene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 120-12-7 | Anthracene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.0272 | ug/L | 0.0087 | 0.0272 |
| 218-01-9 | Chrysene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 206-44-0 | Fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 86-73-7 | Fluorene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 91-20-3 | Naphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 85-01-8 | Phenanthrene | U | 0.543 | ug/L | 0.198 | 0.543 |
| 129-00-0 | Pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 131 | 272 | ug/L | 48.2 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468021** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 21:02** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1611.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.543 | ug/L | 0.237 | 0.543 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 83-32-9 | Acenaphthene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 208-96-8 | Acenaphthylene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 120-12-7 | Anthracene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.0272 | ug/L | 0.0087 | 0.0272 |
| 218-01-9 | Chrysene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 206-44-0 | Fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 86-73-7 | Fluorene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 91-20-3 | Naphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 85-01-8 | Phenanthrene | U | 0.543 | ug/L | 0.198 | 0.543 |
| 129-00-0 | Pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 137 | 272 | ug/L | 50.5 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468026** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 21:44** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1612.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.543 | ug/L | 0.237 | 0.543 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 83-32-9 | Acenaphthene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 208-96-8 | Acenaphthylene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 120-12-7 | Anthracene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.0272 | ug/L | 0.0087 | 0.0272 |
| 218-01-9 | Chrysene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 206-44-0 | Fluoranthene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 86-73-7 | Fluorene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |
| 91-20-3 | Naphthalene | U | 0.543 | ug/L | 0.163 | 0.543 |
| 85-01-8 | Phenanthrene | U | 0.543 | ug/L | 0.198 | 0.543 |
| 129-00-0 | Pyrene | U | 0.0543 | ug/L | 0.0174 | 0.0543 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 126 | 272 | ug/L | 46.2 | (21%-92%) |

# QC Summary

**PAH by HPLC**

**Surrogate Recovery Report**

**SDG Number: 2015-40**

**Matrix Type: LIQUID**

**PACK Column (1) : C-18, DAD/FLD**

| Sample ID | Client ID | DFBF %REC |
|---|---|---|
| 1203186654 | MB for batch 1427003 | 60 |
| 1203186655 | LCS for batch 1427003 | 56 |
| 1203186672 | LCSD for batch 1427003 | 57 |
| 358468002 | CAWR-14-86935 | 64 |
| 1203186656 | CAWR-14-86935MS | 62 |
| 358468009 | CAWR-14-86939 | 48 |
| 358468015 | CAWR-14-86874 | 48 |
| 358468021 | CAWR-14-86875 | 51 |
| 358468026 | CAWR-14-86880 | 46 |

| Surrogate | Acceptance Limits |
|---|---|
| DFBF = Decafluorobiphenyl | (21%-92%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1427003**
**Lab Sample ID** **1203186655**
**Instrument:** **HPLCE.I**
**Analyst:** **MAP**
**Inj. Vol:** **20 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/16/2014 16:49**
**Prep Batch ID:** **1427003**
**Batch ID:** **1427006**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 32.4 | 65 | 46-92 |
| 91-57-6 | LCS | 2-Methylnaphthalene | 50.0 | 0.0 | 37.6 | 75 | 45-106 |
| 90-12-0 | LCS | 1-Methylnaphthalene | 50.0 | 0.0 | 34.9 | 70 | 47-93 |
| 208-96-8 | LCS | Acenaphthylene | 50.0 | 0.0 | 36.2 | 72 | 55-101 |
| 83-32-9 | LCS | Acenaphthene | 50.0 | 0.0 | 38.6 | 77 | 56-102 |
| 86-73-7 | LCS | Fluorene | 50.0 | 0.0 | 39.0 | 78 | 59-106 |
| 85-01-8 | LCS | Phenanthrene | 50.0 | 0.0 | 40.7 | 81 | 61-106 |
| 120-12-7 | LCS | Anthracene | 50.0 | 0.0 | 44.8 | 90 | 70-123 |
| 206-44-0 | LCS | Fluoranthene | 5.00 | 0.0 | 4.02 | 80 | 62-120 |
| 129-00-0 | LCS | Pyrene | 5.00 | 0.0 | 4.17 | 83 | 65-120 |
| 56-55-3 | LCS | Benzo(a)anthracene | 5.00 | 0.0 | 4.30 | 86 | 67-120 |
| 218-01-9 | LCS | Chrysene | 5.00 | 0.0 | 4.25 | 85 | 72-124 |
| 205-99-2 | LCS | Benzo(b)fluoranthene | 5.00 | 0.0 | 4.07 | 81 | 60-119 |
| 207-08-9 | LCS | Benzo(k)fluoranthene | 2.50 | 0.0 | 2.23 | 89 | 56-108 |
| 50-32-8 | LCS | Benzo(a)pyrene | 5.00 | 0.0 | 4.45 | 89 | 61-120 |
| 193-39-5 | LCS | Indeno(1,2,3-cd)pyrene | 5.00 | 0.0 | 4.30 | 86 | 60-120 |
| 53-70-3 | LCS | Dibenzo(a,h)anthracene | 5.00 | 0.0 | 4.03 | 81 | 33-113 |
| 191-24-2 | LCS | Benzo(ghi)perylene | 5.00 | 0.0 | 3.75 | 75 | 35-94 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCSD for batch 1427003**
**Lab Sample ID** **1203186672**
**Instrument:** **HPLCE.I**
**Analyst:** **MAP**
**Inj. Vol:** **20 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/16/2014 17:31**
**Prep Batch ID:** **1427003**
**Batch ID:** **1427006**
**Dilution: 1**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 91-20-3 | LCSD Naphthalene | 50.0 | 0.0 | 32.9 | 66 | 46-92 | 2 | 0-26 |
| 91-57-6 | LCSD 2-Methylnaphthalene | 50.0 | 0.0 | 37.9 | 76 | 45-106 | 1 | 0-20 |
| 90-12-0 | LCSD 1-Methylnaphthalene | 50.0 | 0.0 | 35.4 | 71 | 47-93 | 1 | 0-20 |
| 208-96-8 | LCSD Acenaphthylene | 50.0 | 0.0 | 36.7 | 73 | 55-101 | 1 | 0-20 |
| 83-32-9 | LCSD Acenaphthene | 50.0 | 0.0 | 38.8 | 78 | 56-102 | 1 | 0-20 |
| 86-73-7 | LCSD Fluorene | 50.0 | 0.0 | 38.6 | 77 | 59-106 | 1 | 0-20 |
| 85-01-8 | LCSD Phenanthrene | 50.0 | 0.0 | 39.9 | 80 | 61-106 | 2 | 0-20 |
| 120-12-7 | LCSD Anthracene | 50.0 | 0.0 | 43.9 | 88 | 70-123 | 2 | 0-20 |
| 206-44-0 | LCSD Fluoranthene | 5.00 | 0.0 | 3.91 | 78 | 62-120 | 3 | 0-20 |
| 129-00-0 | LCSD Pyrene | 5.00 | 0.0 | 4.05 | 81 | 65-120 | 3 | 0-20 |
| 56-55-3 | LCSD Benzo(a)anthracene | 5.00 | 0.0 | 4.21 | 84 | 67-120 | 2 | 0-20 |
| 218-01-9 | LCSD Chrysene | 5.00 | 0.0 | 4.10 | 82 | 72-124 | 4 | 0-20 |
| 205-99-2 | LCSD Benzo(b)fluoranthene | 5.00 | 0.0 | 3.93 | 79 | 60-119 | 3 | 0-20 |
| 207-08-9 | LCSD Benzo(k)fluoranthene | 2.50 | 0.0 | 2.19 | 88 | 56-108 | 2 | 0-20 |
| 50-32-8 | LCSD Benzo(a)pyrene | 5.00 | 0.0 | 4.32 | 86 | 61-120 | 3 | 0-20 |
| 193-39-5 | LCSD Indeno(1,2,3-cd)pyrene | 5.00 | 0.0 | 4.17 | 83 | 60-120 | 3 | 0-20 |
| 53-70-3 | LCSD Dibenzo(a,h)anthracene | 5.00 | 0.0 | 3.87 | 77 | 33-113 | 4 | 0-20 |
| 191-24-2 | LCSD Benzo(ghi)perylene | 5.00 | 0.0 | 3.62 | 72 | 35-94 | 4 | 0-20 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **CAWR-14-86935MS**
**Lab Sample ID** **1203186656**
**Instrument:** **HPLCE.I**
**Analyst:** **MAP**
**Inj. Vol:** **20 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/16/2014 18:55**
**Prep Batch ID:** **1427003**
**Batch ID:** **1427006**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 91-20-3 | MS | Naphthalene | 59.5 | 0.00 | U | 41.3 | 69 | 31-105 |
| 91-57-6 | MS | 2-Methylnaphthalene | 59.5 | 0.00 | U | 47.7 | 80 | 45-106 |
| 90-12-0 | MS | 1-Methylnaphthalene | 59.5 | 0.00 | U | 44.2 | 74 | 47-93 |
| 208-96-8 | MS | Acenaphthylene | 59.5 | 0.00 | U | 45.4 | 76 | 42-107 |
| 83-32-9 | MS | Acenaphthene | 59.5 | 0.00 | U | 48.3 | 81 | 43-107 |
| 86-73-7 | MS | Fluorene | 59.5 | 0.00 | U | 47.9 | 80 | 48-109 |
| 85-01-8 | MS | Phenanthrene | 59.5 | 0.00 | U | 49.2 | 83 | 52-111 |
| 120-12-7 | MS | Anthracene | 59.5 | 0.00 | U | 53.9 | 90 | 56-125 |
| 206-44-0 | MS | Fluoranthene | 5.95 | 0.00 | U | 4.83 | 81 | 48-115 |
| 129-00-0 | MS | Pyrene | 5.95 | 0.00 | U | 4.99 | 84 | 47-130 |
| 56-55-3 | MS | Benzo(a)anthracene | 5.95 | 0.00 | U | 5.12 | 86 | 51-116 |
| 218-01-9 | MS | Chrysene | 5.95 | 0.00 | U | 5.14 | 86 | 56-130 |
| 205-99-2 | MS | Benzo(b)fluoranthene | 5.95 | 0.00 | U | 4.83 | 81 | 45-120 |
| 207-08-9 | MS | Benzo(k)fluoranthene | 2.98 | 0.00 | U | 2.68 | 90 | 39-122 |
| 50-32-8 | MS | Benzo(a)pyrene | 5.95 | 0.00 | U | 5.32 | 89 | 48-119 |
| 193-39-5 | MS | Indeno(1,2,3-cd)pyrene | 5.95 | 0.00 | U | 5.11 | 86 | 45-120 |
| 53-70-3 | MS | Dibenzo(a,h)anthracene | 5.95 | 0.00 | U | 5.69 | 96 | 33-136 |
| 191-24-2 | MS | Benzo(ghi)perylene | 5.95 | 0.00 | U | 4.63 | 78 | 34-115 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1427003** | **Instrument ID:** | **HPLCE.I** | **Data File:** | **ph5j1604.d** |
| **Lab Sample ID:** | **1203186654** | **Prep Date:** | **10/13/2014 16:50** | **Analyzed:** | **10/16/14 16:06** |
| **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1427003 | 1203186655 | ph5j1605.d | 10/16/14 | 1649 |
| 02 LCSD for batch 1427003 | 1203186672 | ph5j1606.d | 10/16/14 | 1731 |
| 03 CAWR-14-86935 | 358468002 | ph5j1607.d | 10/16/14 | 1813 |
| 04 CAWR-14-86935MS | 1203186656 | ph5j1608.d | 10/16/14 | 1855 |
| 05 CAWR-14-86939 | 358468009 | ph5j1609.d | 10/16/14 | 1937 |
| 06 CAWR-14-86874 | 358468015 | ph5j1610.d | 10/16/14 | 2020 |
| 07 CAWR-14-86875 | 358468021 | ph5j1611.d | 10/16/14 | 2102 |
| 08 CAWR-14-86880 | 358468026 | ph5j1612.d | 10/16/14 | 2144 |

# QC Data

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203186654** | | | | |
| **Client Sample:** | **QC for batch 1427003** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1427003** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 16:06** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1604.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.500 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.025 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | U | 0.500 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 150 | 250 | ug/L | 60.2 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203186655** | | | | |
| **Client Sample:** | **QC for batch 1427003** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1427003** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 16:49** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1605.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 34.9 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | | 37.6 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | | 38.6 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | | 36.2 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | | 44.8 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | | 4.30 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | | 4.45 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.07 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | | 3.75 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.23 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | | 4.25 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 4.03 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | | 4.02 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | | 39.0 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.30 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | | 32.4 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | | 40.7 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | | 4.17 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 139 | 250 | ug/L | 55.6 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203186672** | | | | |
| **Client Sample:** | **QC for batch 1427003** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1427003** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 17:31** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1606.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 35.4 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | | 37.9 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | | 38.8 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | | 36.7 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | | 43.9 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | | 4.21 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | | 4.32 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | | 3.93 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | | 3.62 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.19 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | | 4.10 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 3.87 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | | 3.91 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | | 38.6 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.17 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | | 32.9 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | | 39.9 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | | 4.05 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 141 | 250 | ug/L | 56.5 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203186656** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1427003** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAWR-14-86935MS** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1427006** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 18:55** | **Analyst:** | **MAP** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **10/13/2014 16:50** | **Aliquot:** | **840 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5j1608.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 44.2 | ug/L | 0.260 | 0.595 |
| 91-57-6 | 2-Methylnaphthalene | | 47.7 | ug/L | 0.179 | 0.595 |
| 83-32-9 | Acenaphthene | | 48.3 | ug/L | 0.179 | 0.595 |
| 208-96-8 | Acenaphthylene | | 45.4 | ug/L | 0.179 | 0.595 |
| 120-12-7 | Anthracene | | 53.9 | ug/L | 0.179 | 0.595 |
| 56-55-3 | Benzo(a)anthracene | | 5.12 | ug/L | 0.019 | 0.0595 |
| 50-32-8 | Benzo(a)pyrene | | 5.32 | ug/L | 0.019 | 0.0595 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.83 | ug/L | 0.019 | 0.0595 |
| 191-24-2 | Benzo(ghi)perylene | | 4.63 | ug/L | 0.019 | 0.0595 |
| 207-08-9 | Benzo(k)fluoranthene | | 2.68 | ug/L | 0.00952 | 0.0298 |
| 218-01-9 | Chrysene | | 5.14 | ug/L | 0.019 | 0.0595 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 5.69 | ug/L | 0.019 | 0.0595 |
| 206-44-0 | Fluoranthene | | 4.83 | ug/L | 0.019 | 0.0595 |
| 86-73-7 | Fluorene | | 47.9 | ug/L | 0.179 | 0.595 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 5.11 | ug/L | 0.019 | 0.0595 |
| 91-20-3 | Naphthalene | | 41.3 | ug/L | 0.179 | 0.595 |
| 85-01-8 | Phenanthrene | | 49.2 | ug/L | 0.217 | 0.595 |
| 129-00-0 | Pyrene | | 4.99 | ug/L | 0.019 | 0.0595 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 186 | 298 | ug/L | 62.4 | (21%-92%) |

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1428696 |
| Prep Batch Number: | 1428695 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203190773 | Interference Check Sample (ICS) |
| 1203190769 | Method Blank (MB) |
| 1203190770 | Laboratory Control Sample (LCS) |
| 1203190771 | 359259007(CAMO-14-87142) Matrix Spike (MS) |
| 1203190772 | 359259007(CAMO-14-87142) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
The initial calibration verification standard (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 359259007 (CAMO-14-87142) from SDG 2015-89 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Manual integrations were not required for any data file in this SDG.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Chromatographic Columns

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 21 OCT 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-86962

**Date Received:** 08-OCT-14

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 358468005

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.972 | ug/L | | 1 | 19-OCT-14 13:32 | per1019015a |
| | Perchlorate Isotope Ratio | | | 3.2 | | | 1 | 19-OCT-14 13:32 | per1019015a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.915 | ug/L | | 1 | 19-OCT-14 13:32 | per1019015a |
| | Perchlorate-O(18) | | | 0.551 | ug/L | | 1 | 19-OCT-14 13:32 | per1019015a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-86966

**Date Received:** 08-OCT-14

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 358468013

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.0585 | ug/L | J | 1 | 19-OCT-14 13:40 | per1019016a |
| | Perchlorate Isotope Ratio | | | 2.96 | | | 1 | 19-OCT-14 13:40 | per1019016a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.0595 | ug/L | J | 1 | 19-OCT-14 13:40 | per1019016a |
| | Perchlorate-O(18) | | | 0.549 | ug/L | | 1 | 19-OCT-14 13:40 | per1019016a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-86874

**Date Received:** 08-OCT-14

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 358468019

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 19-OCT-14 13:48 | per1019017a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 19-OCT-14 13:48 | per1019017a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 19-OCT-14 13:48 | per1019017a |
| | Perchlorate-O(18) | | | 0.494 | ug/L | | 1 | 19-OCT-14 13:48 | per1019017a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-86884

**Date Received:** 08-OCT-14

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 358468030

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.0611 | ug/L | J | 1 | 19-OCT-14 13:56 | per1019018a |
| | Perchlorate Isotope Ratio | | | 3.04 | | | 1 | 19-OCT-14 13:56 | per1019018a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.0605 | ug/L | J | 1 | 19-OCT-14 13:56 | per1019018a |
| | Perchlorate-O(18) | | | 0.537 | ug/L | | 1 | 19-OCT-14 13:56 | per1019018a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2015-40

**Extract Batch Code:** 1428695

**Date Filtered:** 19-OCT-14

**Matrix:** WATER

**Sample ID:** 1203190770

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .191 | ug/L | 95.5 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 2.95 | | | | - |
| Perchlorate-101 | 0.200 | .195 | ug/L | 97.6 | | 85 - 115 |
| Perchlorate-O(18) | | .497 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2015-40

**Extract Batch Code:** 1428695

**Date Extracted:** 19-OCT-14

**GEL MS/PS ID:** 1203190771

**Client ID:** CAMO-14-87142

**GEL MSD/PSD ID:** 1203190772

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.503 | ug/L | 0.687 | 92.3 | .712 | 105 | 3.55 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.08 | | 2.98 | | 3.01 | | 1.19 | | - |
| Perchlorate-101 | 0.200 | 0.492 | ug/L | 0.695 | 101 | .711 | 110 | 2.36 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.553 | ug/L | 0.562 | | .553 | | 1.56 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 19-OCT-14

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 1203190769

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 19-OCT-14 13:09 | per1019012a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 19-OCT-14 13:09 | per1019012a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 19-OCT-14 13:09 | per1019012a |
| | Perchlorate-O(18) | | | 0.497 | ug/L | | 1 | 19-OCT-14 13:09 | per1019012a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 19-OCT-14

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 1203190770

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.191 | ug/L | J | 1 | 19-OCT-14 13:17 | per1019013a |
| | Perchlorate Isotope Ratio | | | 2.95 | | | 1 | 19-OCT-14 13:17 | per1019013a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.195 | ug/L | J | 1 | 19-OCT-14 13:17 | per1019013a |
| | Perchlorate-O(18) | | | 0.497 | ug/L | | 1 | 19-OCT-14 13:17 | per1019013a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 1203190773

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.211 | ug/L | | 1 | 19-OCT-14 13:25 | per1019014a |
| | Perchlorate Isotope Ratio | | | 3.04 | | | 1 | 19-OCT-14 13:25 | per1019014a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.209 | ug/L | | 1 | 19-OCT-14 13:25 | per1019014a |
| | Perchlorate-O(18) | | | 0.514 | ug/L | | 1 | 19-OCT-14 13:25 | per1019014a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-87142MS

**Date Received:** 17-OCT-14

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 1203190771

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.687 | ug/L | | 1 | 19-OCT-14 15:40 | per1019031a |
| | Perchlorate Isotope Ratio | | | 2.98 | | | 1 | 19-OCT-14 15:40 | per1019031a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.695 | ug/L | | 1 | 19-OCT-14 15:40 | per1019031a |
| | Perchlorate-O(18) | | | 0.562 | ug/L | | 1 | 19-OCT-14 15:40 | per1019031a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1428695

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAMO-14-87142MSD

**Date Received:** 17-OCT-14

**GEL Job No (SDG):** 2015-40

**GEL Sample ID:** 1203190772

**Date Filtered:** 19-OCT-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.712 | ug/L | | 1 | 19-OCT-14 15:48 | per1019032a |
| | Perchlorate Isotope Ratio | | | 3.01 | | | 1 | 19-OCT-14 15:48 | per1019032a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.711 | ug/L | | 1 | 19-OCT-14 15:48 | per1019032a |
| | Perchlorate-O(18) | | | 0.553 | ug/L | | 1 | 19-OCT-14 15:48 | per1019032a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Explosives by LCMSMS Analysis

# Case Narrative

**LC-MS/MS Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Analysis of Nitroaromatic Explosives Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by SW-846 Method 8321 Modified (8321M)** |
| Analytical Method: | SW846 3535/8321A Modified |
| Prep Method: | SW846 Method 3535 |
| Analytical Batch Number: | 1425807 |
| Prep Batch Number: | 1425803 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535/8321A Modified:

| Sample ID | Client ID |
|---|---|
| 358468018 | CAWR-14-86874 |
| 1203183857 | MB for batch 1425803 |
| 1203183858 | Laboratory Control Sample (LCS) |
| 1203183859 | Laboratory Control Sample Duplicate (LCSD) |

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-056 REV# 17.

**Primary Analyte Analysis**

## Calibration Information

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
All low level calibration verification (CRI) requirements for this analysis were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS (1203183858) did not meet acceptance criteria for the recovery of Tetryl at 22.4%. The limits are 62-117%. The samples were not re-extracted because they were more than two times outside of the holding period. The data are reported with the appropriate DER.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD (1203183859) did not meet acceptance criteria for the recovery of Tetryl at 25.2%. The limits are 62-117%. The samples were not re-extracted because they were more than two times outside of the holding period. The data are reported with the appropriate DER.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPDs between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
A matrix spike and matrix spike duplicate were not performed with this SDG in this batch.

**Internal Standard (ISTD) Acceptance**
A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000.

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

**Secondary Analyte Analysis**

**Calibration Information**

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
All low level calibration verification (CRI) requirements for this analysis were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries were within the established acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries were within the established acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPDs between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
A matrix spike and matrix spike duplicate were not performed with this SDG in this batch.

**Internal Standard (ISTD) Acceptance**
The internal standards were not added to the Secondary analyte extracts.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data Exception Report 1350525 was generated for this SDG.

**Manual Integrations**
Manual integrations were not performed on the samples in this analytical batch.

**Additional Comments**
Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct.

Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LC-MS/MS #1, and LC-MS/MS #2, respectively. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis.

The laboratory also utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC-MS/MS #3 or LC-MS/MS #4. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

The detection of the Primary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

The detection of the Secondary analytes is accomplished through analysis on the following reversed phase column:

YMC: J'sphere ODS-H80, 150 x 4.6mm I.D.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 03 NOV 2014**  **Title: Group Leader**

# Sample Data Summary

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-86874

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 358468018

**Sample Amount** 950 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXP1030016.wiff

**Date Analyzed:** 31-OCT-14 00:21

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.263 | U | 0.0842 | 0.263 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.263 | U | 0.0842 | 0.263 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.263 | U | 0.0863 | 0.263 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.263 | U | 0.0842 | 0.263 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.263 | U | 0.0842 | 0.263 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.263 | U | 0.0842 | 0.263 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.526 | U | 0.0842 | 0.526 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-86874

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 358468018

**Sample Amount** 950 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.526 | U | 0.105 | 0.526 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.526 | U | 0.158 | 0.526 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-86874

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 358468018

**Sample Amount** 950 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS10280029.wiff

**Date Analyzed:** 28-OCT-14 22:03

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.05 | U | 0.316 | 1.05 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.05 | U | 0.316 | 1.05 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.05 | U | 0.316 | 1.05 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.63 | U | 0.526 | 2.63 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.63 | U | 0.526 | 2.63 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# Quality Control Summary

# High Explosives Surrogate Recovery Summary

**Lab Name:** GEL Laboratories LLC **GEL Job No (SDG):** 2015-40

**Lab Code:** GEL **HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 358468018 | CAWR-14-86874 | 92 | 65 - 114 | |
| 1203183857 | MB for batch 1425803 | 85.6 | 65 - 114 | |
| 1203183858 | LCS for batch 1425803 | 90 | 65 - 114 | |
| 1203183859 | LCSD for batch 1425803 | 90 | 65 - 114 | |

DNT = 3,4-Dinitrotoluene

**Lab Code:** GEL **HPLC Column:** YMC J'sphere ODS-H80

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 358468018 | CAWR-14-86874 | 94.4 | 65 - 114 | |
| 1203183857 | MB for batch 1425803 | 90 | 65 - 114 | |
| 1203183858 | LCS for batch 1425803 | 92 | 65 - 114 | |
| 1203183859 | LCSD for batch 1425803 | 92.4 | 65 - 114 | |

DNT = 3,4-Dinitrotoluene

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Extract Batch Code:** 1425803

**Date Extracted:** 09-OCT-14

**GEL LCS ID:** 1203183858

**GEL LCSDUP ID:** 1203183859

**Analysis Date/Time:** 30-OCT-14 23:11

**DUP Analysis Date/Time:** 30-OCT-14 23:46

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec | # | LCSD Conc | LCSD Rec | # | RPD | # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | 5 | 3.84 | 76.8 | | 4.14 | 82.8 | | 7.52 | | 25 | 70 - 116 |
| 2,4,6-Trinitrotoluene | 5 | 4.37 | 87.4 | | 4.11 | 82.2 | | 6.13 | | 25 | 71 - 119 |
| 2,6-Dinitrotoluene | 5 | 4.45 | 89 | | 4.31 | 86.2 | | 3.2 | | 25 | 73 - 108 |
| 2-Amino-4,6-dinitrotoluene | 5 | 4.22 | 84.4 | | 4.41 | 88.2 | | 4.4 | | 25 | 71 - 119 |
| 2,4-Dinitrotoluene | 5 | 4.63 | 92.6 | | 4.45 | 89 | | 3.97 | | 25 | 74 - 114 |
| 4-Amino-2,6-dinitrotoluene | 5 | 4.45 | 89 | | 4.49 | 89.8 | | .895 | | 25 | 75 - 120 |
| Nitrobenzene | 5 | 4.54 | 90.8 | | 4.34 | 86.8 | | 4.51 | | 25 | 65 - 112 |
| RDX | 5 | 4.6 | 92 | | 4.68 | 93.6 | | 1.72 | | 25 | 71 - 125 |
| m-Dinitrobenzene | 5 | 5.42 | 108 | | 5.02 | 100 | | 7.66 | | 25 | 73 - 119 |
| p-Nitrotoluene | 5 | 4.93 | 98.6 | | 5.15 | 103 | | 4.37 | | 25 | 65 - 113 |
| o-Nitrotoluene | 5 | 4.32 | 86.4 | | 4.27 | 85.4 | | 1.16 | | 25 | 65 - 111 |
| m-Nitrotoluene | 5 | 4.5 | 90 | | 4.56 | 91.2 | | 1.33 | | 25 | 67 - 112 |
| Tetryl | 5 | 1.12 | 22.4 | * | 1.26 | 25.2 | * | 11.8 | | 19 | 62 - 117 |
| PETN | 5 | 4.13 | 82.6 | | 4.01 | 80.2 | | 2.95 | | 25 | 64 - 119 |
| HMX | 5 | 4.37 | 87.4 | | 4 | 80 | | 8.84 | | 25 | 61 - 118 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Extract Batch Code:** 1425803

**Date Extracted:** 09-OCT-14

**GEL LCS ID:** 1203183858

**GEL LCSDUP ID:** 1203183859

**Analysis Date/Time:** 28-OCT-14 21:30

**DUP Analysis Date/Time:** 28-OCT-14 21:47

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec | # | LCSD Conc | LCSD Rec | # | RPD | # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,6-Diamino-4-nitrotoluene | 5 | 4.24 | 84.8 | | 4.36 | 87.2 | | 2.79 | | 25 | 65 - 110 |
| 3,5-Dinitroaniline | 5 | 3.69 | 73.8 | | 3.69 | 73.8 | | 0 | | 25 | 69 - 118 |
| 2,4-Diamino-6-nitrotoluene | 5 | 3.96 | 79.2 | | 3.83 | 76.6 | | 3.34 | | 25 | 58 - 108 |
| TATB | 5 | 6.42 | 128 | | 6.4 | 128 | | .312 | | 11 | 23 - 142 |
| tris(o-cresyl) phosphate | 5 | 3.75 | 75 | | 3.77 | 75.4 | | .532 | | 25 | 42 - 89 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

# Quality Control Data

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183857

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1030013.wiff

**Date Analyzed:** 30-OCT-14 22:36

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.250 | U | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.250 | U | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.250 | U | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.500 | U | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183857

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.500 | U | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.500 | U | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183857

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS10280026.wiff

**Date Analyzed:** 28-OCT-14 21:13

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.00 | U | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.00 | U | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.00 | U | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.50 | U | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.50 | U | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183858

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1030014.wiff

**Date Analyzed:** 30-OCT-14 23:11

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 1.12 | | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 3.84 | | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 78-11-5 | PETN | 4.13 | | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.22 | | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.32 | | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.37 | | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 2691-41-0 | HMX | 4.37 | | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.45 | | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.45 | | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.5 | | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 4.54 | | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 121-82-4 | RDX | 4.6 | | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.63 | | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183858

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 99-99-0 | p-Nitrotoluene | 4.93 | | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 5.42 | | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183858

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS10280027.wiff

**Date Analyzed:** 28-OCT-14 21:30

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 618-87-1 | 3,5-Dinitroaniline | 3.69 | | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 3.75 | | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 3.96 | | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.24 | | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 3058-38-6 | TATB | 6.42 | | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCSD for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183859

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1030015.wiff

**Date Analyzed:** 30-OCT-14 23:46

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 479-45-8 | Tetryl | 1.26 | | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |
| 2691-41-0 | HMX | 4 | | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 78-11-5 | PETN | 4.01 | | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.11 | | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.14 | | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 88-72-2 | o-Nitrotoluene | 4.27 | | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.31 | | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 4.34 | | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.41 | | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.45 | | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.49 | | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 4.56 | | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 121-82-4 | RDX | 4.68 | | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCSD for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183859

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 99-65-0 | m-Dinitrobenzene | 5.02 | | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 99-99-0 | p-Nitrotoluene | 5.15 | | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCSD for batch 1425803

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-40

**Matrix:** WATER

**GEL Sample ID:** 1203183859

**Sample Amount** 1000 mL

**Date Received:** 08-OCT-14

**Moisture:**

**Extraction Batch ID:** 1425803

**Extraction Type** Sol Exchange

**Date Extracted:** 09-OCT-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS10280028.wiff

**Date Analyzed:** 28-OCT-14 21:47

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 618-87-1 | 3,5-Dinitroaniline | 3.69 | | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 3.77 | | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 3.83 | | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.36 | | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 3058-38-6 | TATB | 6.4 | | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 30-OCT-14 15:37

**GEL Data File:** EXP1030001.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | .41 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | .327 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 30-OCT-14 16:12

**GEL Data File:** EXP1030002.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | .436 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | .368 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 28-OCT-14 14:15

**GEL Data File:** EXS10280001.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 28-OCT-14 14:32

**GEL Data File:** EXS10280002.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 30-OCT-14 20:16

**GEL Data File:** EXP1030009.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | .444 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | .408 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 30-OCT-14 21:26

**GEL Data File:** EXP1030011.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | .438 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | .435 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 31-OCT-14 00:56

**GEL Data File:** EXP1030017.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | .432 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | .499 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 31-OCT-14 05:01

**GEL Data File:** EXP1030024.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | .494 |
| 1,3,5-Trinitrobenzene | 0 | .277 |
| 2,4,6-Trinitrotoluene | 0 | .248 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | .55 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 28-OCT-14 16:46

**GEL Data File:** EXS10280010.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.8 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 10.1 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 28-OCT-14 17:19

**GEL Data File:** EXS10280012.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 4.81 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 28-OCT-14 20:40

**GEL Data File:** EXS10280024.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| tris(o-cresyl) phosphate | 0 | 3.53 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 28-OCT-14 22:20

**GEL Data File:** EXS10280030.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 2.33 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-40

**Lab Code:** GEL

**Lab Sample ID:** XIBLK06

**Analysis Date:** 28-OCT-14 23:10

**GEL Data File:** EXS10280033.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 4.28 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 01-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LC-MS/MS | SW846 3535/8321A Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1425807 | See Below | | |

**Potentially affected work order(s)(SDG): 358468(2015-40)**

**Application Issues:**

Failed Recovery for LCS/LCSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The LCS (1203183858) did not meet acceptance criteria for the recovery of Tetryl at 22.4%. The limits are 62-117%.<br><br>2. The LCSD (1203183859) did not meet acceptance criteria for the recovery of Tetryl at 25.2%. The limits are 62-117%. | 1. & 2. The samples were not re-extracted because they were more than two times outside of the holding period. The data are reported with the appropriate DER. |

**Originator's Name:**

Lynne Russell 01-NOV-14

**Data Validator/Group Leader:**

Michael Penny 03-NOV-14

# Pesticide Analysis

# Case Narrative

**Pesticide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water by GC/ECD Using Methods 504.1 or 8011** |
| Analytical Method: | SW846 8011 |
| Prep Method: | SW846 8011 PREP |
| Analytical Batch Number: | 1427216 |
| Prep Batch Number: | 1427215 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 358468001 | CAWR-14-86935 |
| 358468006 | CAWR-14-86912 |
| 358468008 | CAWR-14-86939 |
| 358468014 | CAWR-14-86874 |
| 358468020 | CAWR-14-86875 |
| 358468025 | CAWR-14-86880 |
| 358468031 | CAWR-14-86910 |
| 1203187226 | MB for batch 1427215 |
| 1203187227 | Laboratory Control Sample (LCS) |
| 1203187228 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-059 REV# 13.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Sample 358468006 (CAWR-14-86912) did not meet acceptance criteria for surrogate recovery with a positive bias likely due to co-elution with a matrix peak. Target analytes were not detected in the sample and there was no more sample left for re-extraction. The data were reported.

**Laboratory Control Sample (LCS) Recovery**
The laboratory control sample (LCS) spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD values between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike (MS) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike Duplicate (MSD) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**MS/MSD Relative Percent Difference (RPD) Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Technical Information:**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG in this analytical batch met the specified holding time.

**Sample preservation**
Samples had a pH of 2. 358468006 (CAWR-14-86912) and 358468031 (CAWR-14-86910).

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

**Sample Dilutions**
The samples in this SDG in this analytical batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Electronic Package Comment**

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1344867. 358468006 (CAWR-14-86912).

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

**Additional Comments**
The higher result is reported.

**System Configuration**

The 504.1/8011 analysis of EDB/DBCP was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-50-504/8011 | 30m x 0.53mm, 1.00um |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |

| | | | | |
|---|---|---|---|---|
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-XLB-504/8 | 30m x 0.53mm, 1.50um |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40 GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

E Concentration of the target analyte exceeds the instrument calibration range

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Cameron Bearden **Name: Cameron Bearden**

**Date: 04 NOV 2014** **Title: Group Leader**

# Sample Data Summary

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468001** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86935** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/15/2014 22:17** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **34.56 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1520.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1520.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0203 | ug/L | 0.00608 | 0.0203 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0203 | ug/L | 0.00608 | 0.0203 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.74 | 3.62 | ug/L | 103 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468006** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86912** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/15/2014 22:38** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **35.49 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1521.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1521.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0197 | ug/L | 0.00592 | 0.0197 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0197 | ug/L | 0.00592 | 0.0197 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | | Acceptable Limits |
|---|---|---|---|---|---|---|
| Bromofluorobenzene | 12.2 | 3.52 | ug/L | 348 | * | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468008** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/15/2014 23:00** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **34.29 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1522.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1522.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0204 | ug/L | 0.00612 | 0.0204 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0204 | ug/L | 0.00612 | 0.0204 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.35 | 3.65 | ug/L | 91.9 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468014** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 00:03** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **34.69 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1525.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1525.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0202 | ug/L | 0.00605 | 0.0202 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0202 | ug/L | 0.00605 | 0.0202 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.30 | 3.60 | ug/L | 91.4 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468020** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 00:24** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **35.18 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1526.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1526.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0199 | ug/L | 0.00597 | 0.0199 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0199 | ug/L | 0.00597 | 0.0199 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.50 | 3.55 | ug/L | 98.4 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468025** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 00:46** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **34.36 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1527.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1527.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0204 | ug/L | 0.00611 | 0.0204 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0204 | ug/L | 0.00611 | 0.0204 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.11 | 3.64 | ug/L | 85.6 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468031** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86910** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/16/2014 01:07** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **34.04 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1528.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1528.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0206 | ug/L | 0.00617 | 0.0206 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0206 | ug/L | 0.00617 | 0.0206 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.70 | 3.67 | ug/L | 128 | (56%-145%) |

# Quality Control Summary

**Pesticide**

## Surrogate Recovery Report

**SDG Number: 2015-40**

**Matrix Type: LIQUID**

| Sample ID | Client ID | BFB 1 %REC # | BFB 2 %REC # |
|---|---|---|---|
| 1203187226 | MB for batch 1427215 | 94 | 106 |
| 1203187227 | LCS for batch 1427215 | 93 | 114 |
| 1203187228 | LCSD for batch 1427215 | 91 | 112 |
| 358468001 | CAWR-14-86935 | 92 | 103 |
| 358468006 | CAWR-14-86912 | 106 | 348 * |
| 358468008 | CAWR-14-86939 | 81 | 92 |
| 358468014 | CAWR-14-86874 | 81 | 91 |
| 358468020 | CAWR-14-86875 | 87 | 98 |
| 358468025 | CAWR-14-86880 | 78 | 86 |
| 358468031 | CAWR-14-86910 | 117 | 128 |

| Surrogate | Acceptance Limits |
|---|---|
| BFB = Bromofluorobenzene | (56%-145%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1427215**
**Lab Sample ID** **1203187227**
**Instrument:** **ECD1A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/15/2014 20:52**
**Prep Batch ID:** **1427215**
**Batch ID:** **1427216**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-93-4 | LCS | 1,2-Dibromoethane | 0.200 | 0.0 | 0.203 | 102 | 70-130 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.190 | 95 | 70-130 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCSD for batch 1427215**
**Lab Sample ID** **1203187228**
**Instrument:** **ECD1A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/15/2014 21:13**
**Dilution: 1**
**Prep Batch ID:** **1427215**
**Batch ID:** **1427216**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-93-4 | LCSD 1,2-Dibromoethane | 0.200 | 0.0 | 0.201 | 101 | 70-130 | 1 | 0-20 |
| 96-12-8 | LCSD 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.189 | 94 | 70-130 | 1 | 0-20 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1427215** | **Instrument ID:** | **ECD1A.I_1**<br>**ECD1A.I_2** | **Data File:** | **101514HE\e1j1515.D**<br>**101514HE\e1j1515.D** |
| **Lab Sample ID:** | **1203187226** | | | | |
| **Column:** | **ZB-50**<br>**ZB-XLB** | **Prep Date:** | **10/15/2014 15:49** | **Analyzed:** | **10/15/14 20:31** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1427215** | **1203187227** | **101514HE\e1j1516.D**<br>**101514HE\e1j1516.D** | **10/15/14** | **2052** |
| **02 LCSD for batch 1427215** | **1203187228** | **101514HE\e1j1517.D**<br>**101514HE\e1j1517.D** | **10/15/14** | **2113** |
| **03 CAWR-14-86935** | **358468001** | **101514HE\e1j1520.D**<br>**101514HE\e1j1520.D** | **10/15/14** | **2217** |
| **04 CAWR-14-86912** | **358468006** | **101514HE\e1j1521.D**<br>**101514HE\e1j1521.D** | **10/15/14** | **2238** |
| **05 CAWR-14-86939** | **358468008** | **101514HE\e1j1522.D**<br>**101514HE\e1j1522.D** | **10/15/14** | **2300** |
| **06 CAWR-14-86874** | **358468014** | **101514HE\e1j1525.D**<br>**101514HE\e1j1525.D** | **10/16/14** | **0003** |
| **07 CAWR-14-86875** | **358468020** | **101514HE\e1j1526.D**<br>**101514HE\e1j1526.D** | **10/16/14** | **0024** |
| **08 CAWR-14-86880** | **358468025** | **101514HE\e1j1527.D**<br>**101514HE\e1j1527.D** | **10/16/14** | **0046** |
| **09 CAWR-14-86910** | **358468031** | **101514HE\e1j1528.D**<br>**101514HE\e1j1528.D** | **10/16/14** | **0107** |

# Quality Control Data

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203187226** | | | | |
| **Client Sample:** | **QC for batch 1427215** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1427215** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/15/2014 20:31** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1515.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1515.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.78 | 3.57 | ug/L | 106 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203187227** | | | | |
| **Client Sample:** | **QC for batch 1427215** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1427215** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/15/2014 20:52** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1516.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1516.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.190 | ug/L | 0.006 | 0.020 | 2 |
| 106-93-4 | 1,2-Dibromoethane | | 0.203 | ug/L | 0.006 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.08 | 3.57 | ug/L | 114 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203187228** | | | | |
| **Client Sample:** | **QC for batch 1427215** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1427215** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1427216** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/15/2014 21:13** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/15/2014 15:49** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **101514HE\e1j1517.D** | **Column:** | **1 ZB-50** | | |
| | **101514HE\e1j1517.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.189 | ug/L | 0.006 | 0.020 | 2 |
| 106-93-4 | 1,2-Dibromoethane | | 0.201 | ug/L | 0.006 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.99 | 3.57 | ug/L | 112 | (56%-145%) |

# Miscellaneous

**DER Report No.: 1344867**
**Revision No.:**

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 16-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| GC/ECD | SW846 8011 | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1427216 | See Below | | |

**Potentially affected work order(s)(SDG): 358468(2015-40)**

**Application Issues:**

Failed Yield for Surrogates

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Surrogates recovered outside of acceptance limits for sample 358468006. | 1. The recovery was biased high and no target analytes were detected in the sample; the reported data were not adversely impacted by the surrogate failures. |

**Originator's Name:**

Lindsey Jensen 16-OCT-14

**Data Validator/Group Leader:**

Jimin Cao 17-OCT-14

# PCB Analysis

# Case Narrative

**PCB Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Polychlorinated Biphenyls by ECD** |
| Analytical Method: | SW846 3535A/8082 |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1427900 |
| Prep Batch Number: | 1427897 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

| Sample ID | Client ID |
|---|---|
| 358468017 | CAWR-14-86874 |
| 358468023 | CAWR-14-86875 |
| 358468028 | CAWR-14-86880 |
| 1203188919 | MB for batch 1427897 |
| 1203188920 | Laboratory Control Sample (LCS) |
| 1203192294 | Laboratory Control Sample Duplicate (LCSD) |
| 1203188921 | 359103002(CAMO-14-87136) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were

within the established retention time windows for this method.

One or more of the five quantified peaks did not meet the acceptance criteria in Aroclor-1260 standard analyzed for this SDG; however, the average concentration of the five quantified peaks met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
ARSL sample 359103002 (CAMO-14-87136) of similar matrix in SDG 2015-79 was selected for the matrix spike analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in for the samples reported in this batch.

**Miscellaneous Information**

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The column 1 has been chosen as the primary column. The data are reported from the column 1 for all samples in this batch.

Due to software issue, the surrogate recovery range was not indicated in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

**System Configuration**

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD9A.I_1 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 1 | 30m x 0.25mm, 0.25um |
| ECD9A.I_2 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 2 | 30m x 0.25mm, 0.20um |

**Method/Analysis Information**

| | |
|---|---|
| **Procedure:** | **Analysis of Polychlorinated Biphenyls by ECD** |
| Analytical Method: | SW846 3535A/8082 |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1431092 |
| Prep Batch Number: | 1431090 |

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

| Sample ID | Client ID |
|---|---|
| 358468011 | CAWR-14-86939 |
| 1203196957 | MB for batch 1431090 |
| 1203196958 | Laboratory Control Sample (LCS) |
| 1203196959 | 359671001(MK01710-14) Matrix Spike (MS) |
| 1203196960 | 359671001(MK01710-14) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

**Preparation/Analytical Method Verification**

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

**Calibration Information**

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

One or more of the five quantified peaks did not meet the acceptance criteria in Aroclor-1260 standards analyzed for this SDG; however, the average concentration of the five quantified peaks met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
A non-ARSL sample of similar matrix was selected for the matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPD between the MS and MSD met the acceptance limits.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina. Additionally, copper was added to all sample extracts to remove sulfur.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Sample 358468011 (CAWR-14-86939) was extracted and analyzed twice due to low surrogate recovery in the first analysis. The second analysis was reported in this data package.

**Miscellaneous Information**

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

**Manual Integrations**

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The column 1 has been chosen as the primary column. The data are reported from the column 1 for all samples in this batch.

Due to software issue, the surrogate recovery range was not indicated in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

**System Configuration**

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD9A.I_1 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 1 | 30m x 0.25mm, 0.25um |
| ECD9A.I_2 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 2 | 30m x 0.25mm, 0.20um |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40 GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Jimin Cao **Name: Jimin Cao**

**Date: 04 NOV 2014** **Title: Data Validator**

# Sample Data Summary

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468011** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1431092** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/29/2014 07:35** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/28/2014 07:32** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102914.S\E9j2914.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102914.S\E9j2914.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.127 | 0.208 | ug/L | 61.0 | (33%-102%) |
| Decachlorobiphenyl | 0.0796 | 0.208 | ug/L | 38.2 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468017** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1427900** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/24/2014 15:18** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/24/2014 07:30** | **Aliquot:** | **940 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102414a.S\E9j2417.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102414a.S\E9j2417.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.106 | ug/L | 0.0354 | 0.106 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.106 | ug/L | 0.0354 | 0.106 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.106 | ug/L | 0.0354 | 0.106 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.106 | ug/L | 0.0354 | 0.106 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.106 | ug/L | 0.0354 | 0.106 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.106 | ug/L | 0.0354 | 0.106 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.106 | ug/L | 0.0354 | 0.106 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.106 | ug/L | 0.0354 | 0.106 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.193 | 0.213 | ug/L | 90.7 | (33%-102%) |
| Decachlorobiphenyl | 0.227 | 0.213 | ug/L | 107 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468023** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1427900** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/24/2014 15:34** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/24/2014 07:30** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102414a.S\E9j2418.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102414a.S\E9j2418.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.153 | 0.208 | ug/L | 73.3 | (33%-102%) |
| Decachlorobiphenyl | 0.193 | 0.208 | ug/L | 92.8 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468028** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1427900** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/24/2014 15:49** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/24/2014 07:30** | **Aliquot:** | **990 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102414a.S\E9j2419.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102414a.S\E9j2419.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.168 | 0.202 | ug/L | 83.0 | (33%-102%) |
| Decachlorobiphenyl | 0.202 | 0.202 | ug/L | 99.8 | (33%-125%) |

# Quality Control Summary

**PCB**

## Surrogate Recovery Report

**SDG Number: 2015-40**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|---|---|---|---|---|---|
| 1203188919 | MB for batch 1427897 | 76 | 78 | 96 | 107 |
| 1203188920 | LCS for batch 1427897 | 83 | 86 | 94 | 104 |
| 1203192294 | LCSD for batch 1427897 | 81 | 83 | 97 | 105 |
| 358468017 | CAWR-14-86874 | 91 | 94 | 107 | 118 |
| 358468023 | CAWR-14-86875 | 73 | 76 | 93 | 102 |
| 358468028 | CAWR-14-86880 | 83 | 85 | 100 | 108 |
| 1203188921 | CAMO-14-87136MS | 86 | 89 | 101 | 115 |
| 1203196957 | MB for batch 1431090 | 76 | 80 | 83 | 90 |
| 1203196958 | LCS for batch 1431090 | 73 | 76 | 82 | 89 |
| 358468011 | CAWR-14-86939 | 61 | 63 | 38 | 39 |
| 1203196959 | MK01710-14MS | 56 | 58 | 73 | 76 |
| 1203196960 | MK01710-14MSD | 61 | 62 | 78 | 85 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 4CMX | = 4cmx | (33%-102%) |
| DCB | = Decachlorobiphenyl | (33%-125%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1427897**
**Lab Sample ID** **1203188920**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/24/2014 14:36**
**Dilution: 1**
**Prep Batch ID:** **1427897**
**Batch ID:** **1427900**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCS | Aroclor-1016 | 1.00 | 0.0 | 0.728 | 73 | 47-105 |
| 11096-82-5 | LCS | Aroclor-1260 | 1.00 | 0.0 | 0.644 | 64 | 45-108 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCSD for batch 1427897**
**Lab Sample ID** **1203192294**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/24/2014 14:47**
**Dilution: 1**
**Prep Batch ID:** **1427897**
**Batch ID:** **1427900**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCSD Aroclor-1016 | 1.00 | 0.0 | 0.733 | 73 | 47-105 | 1 | 0-30 |
| 11096-82-5 | LCSD Aroclor-1260 | 1.00 | 0.0 | 0.646 | 65 | 45-108 | 0 | 0-30 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **CAMO-14-87136MS**
**Lab Sample ID** **1203188921**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/24/2014 19:55**
**Prep Batch ID:** **1427897**
**Batch ID:** **1427900**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MS | Aroclor-1016 | 1.00 | 0.00 | U | 0.769 | 77 | 32-108 |
| 11096-82-5 | MS | Aroclor-1260 | 1.00 | 0.00 | U | 0.692 | 69 | 29-110 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1431090**
**Lab Sample ID** **1203196958**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/29/2014 07:24**
**Dilution: 1**
**Prep Batch ID:** **1431090**
**Batch ID:** **1431092**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCS | Aroclor-1016 | 1.00 | 0.0 | 0.640 | 64 | 47-105 |
| 11096-82-5 | LCS | Aroclor-1260 | 1.00 | 0.0 | 0.568 | 57 | 45-108 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **MK01710-14MS**
**Lab Sample ID** **1203196959**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **WS**
**Analysis Date:** **10/29/2014 09:57**
**Prep Batch ID:** **1431090**
**Batch ID:** **1431092**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MS | Aroclor-1016 | 1.00 | 0.00 | U | 0.519 | 52 | 32-108 |
| 11096-82-5 | MS | Aroclor-1260 | 1.00 | 0.00 | U | 0.504 | 50 | 29-110 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **MK01710-14MSD**
**Lab Sample ID** **1203196960**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **WS**
**Analysis Date:** **10/29/2014 10:09**
**Dilution: 1**
**Prep Batch ID:** **1431090**
**Batch ID:** **1431092**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MSD | Aroclor-1016 | 1.00 | 0.00 | U | 0.557 | 56 | 32-108 | 7 | 0-30 |
| 11096-82-5 | MSD | Aroclor-1260 | 1.00 | 0.00 | U | 0.553 | 55 | 29-110 | 9 | 0-30 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1427897** | **Instrument ID:** | **ECD9A.I_1**<br>**ECD9A.I_2** | **Data File:** | **102414a.S\E9j2413.D**<br>**102414a.S\E9j2413.D** |
| **Lab Sample ID:** | **1203188919** | | | | |
| **Column:** | **RTX-CLPEST 1**<br>**RTX-CLPEST 2** | **Prep Date:** | **10/24/2014 07:30** | **Analyzed:** | **10/24/14 14:24** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1427897 | 1203188920 | 102414a.S\E9j2414.D<br>102414a.S\E9j2414.D | 10/24/14 | 1436 |
| 02 LCSD for batch 1427897 | 1203192294 | 102414a.S\E9j2415.D<br>102414a.S\E9j2415.D | 10/24/14 | 1447 |
| 03 CAWR-14-86874 | 358468017 | 102414a.S\E9j2417.D<br>102414a.S\E9j2417.D | 10/24/14 | 1518 |
| 04 CAWR-14-86875 | 358468023 | 102414a.S\E9j2418.D<br>102414a.S\E9j2418.D | 10/24/14 | 1534 |
| 05 CAWR-14-86880 | 358468028 | 102414a.S\E9j2419.D<br>102414a.S\E9j2419.D | 10/24/14 | 1549 |
| 06 CAMO-14-87136MS | 1203188921 | 102414a.S\E9j2436.D<br>102414a.S\E9j2436.D | 10/24/14 | 1955 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1431090** | **Instrument ID:** | **ECD9A.I_1**<br>**ECD9A.I_2** | **Data File:** | **102914.S\E9j2912.D**<br>**102914.S\E9j2912.D** |
| **Lab Sample ID:** | **1203196957** | | | | |
| **Column:** | **RTX-CLPEST 1**<br>**RTX-CLPEST 2** | **Prep Date:** | **10/28/2014 07:32** | **Analyzed:** | **10/29/14 07:13** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1431090** | **1203196958** | **102914.S\E9j2913.D**<br>**102914.S\E9j2913.D** | **10/29/14** | **0724** |
| **02 CAWR-14-86939** | **358468011** | **102914.S\E9j2914.D**<br>**102914.S\E9j2914.D** | **10/29/14** | **0735** |
| **03 MK01710-14MS** | **1203196959** | **102914.S\E9j2926.D**<br>**102914.S\E9j2926.D** | **10/29/14** | **0957** |
| **04 MK01710-14MSD** | **1203196960** | **102914.S\E9j2927.D**<br>**102914.S\E9j2927.D** | **10/29/14** | **1009** |

# Quality Control Data

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203188919** | | | | |
| **Client Sample:** | **QC for batch 1427897** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1427897** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1427900** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/24/2014 14:24** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/24/2014 07:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102414a.S\E9j2413.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102414a.S\E9j2413.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.153 | 0.200 | ug/L | 76.3 | (33%-102%) |
| Decachlorobiphenyl | 0.192 | 0.200 | ug/L | 95.8 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203188920** | | | | |
| **Client Sample:** | **QC for batch 1427897** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1427897** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1427900** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/24/2014 14:36** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/24/2014 07:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102414a.S\E9j2414.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102414a.S\E9j2414.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.728 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.644 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.166 | 0.200 | ug/L | 83.1 | (33%-102%) |
| Decachlorobiphenyl | 0.188 | 0.200 | ug/L | 93.8 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203192294** | | | | |
| **Client Sample:** | **QC for batch 1427897** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1427897** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1427900** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/24/2014 14:47** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/24/2014 07:30** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102414a.S\E9j2415.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102414a.S\E9j2415.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.733 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.646 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.162 | 0.200 | ug/L | 80.9 | (33%-102%) |
| Decachlorobiphenyl | 0.194 | 0.200 | ug/L | 96.8 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203196957** | | | | |
| **Client Sample:** | **QC for batch 1431090** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1431090** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1431092** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/29/2014 07:13** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/28/2014 07:32** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102914.S\E9j2912.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102914.S\E9j2912.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.152 | 0.200 | ug/L | 76.2 | (33%-102%) |
| Decachlorobiphenyl | 0.166 | 0.200 | ug/L | 83.1 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203196958** | | | | |
| **Client Sample:** | **QC for batch 1431090** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1431090** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1431092** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/29/2014 07:24** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/28/2014 07:32** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **102914.S\E9j2913.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **102914.S\E9j2913.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.640 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.568 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.147 | 0.200 | ug/L | 73.4 | (33%-102%) |
| Decachlorobiphenyl | 0.164 | 0.200 | ug/L | 82.2 | (33%-125%) |

# Herbicide Analysis

# Case Narrative

**Herbicide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Chlorophenoxy Acid Herbicides by ECD** |
| Analytical Method: | SW846 8151A |
| Prep Method: | SW846 8151A |
| Analytical Batch Number: | 1426585 |
| Prep Batch Number: | 1426584 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8151A:

| Sample ID | Client ID |
|---|---|
| 358468004 | CAWR-14-86935 |
| 358468010 | CAWR-14-86939 |
| 358468016 | CAWR-14-86874 |
| 358468022 | CAWR-14-86875 |
| 358468027 | CAWR-14-86880 |
| 1203185724 | MB for batch 1426584 |
| 1203185725 | Laboratory Control Sample (LCS) |
| 1203185731 | Laboratory Control Sample Duplicate (LCSD) |
| 1203185726 | 358776004(WST14-14-86623) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-011 REV# 21.

Raw data reports are processed and reviewed by the analyst using ChemStation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All Initial Calibration Verification (ICV) requirements have been met for this SDG. However, not all Calibration Verification Standards (CCV) requirements were met. Pentachlorophenol failed acceptance criteria with a

positive bias on one or both analytical columns in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. Since the target analyte was not detected in the samples 358468004 (CAWR-14-86935), 358468010 (CAWR-14-86939), 358468016 (CAWR-14-86874), 358468022 (CAWR-14-86875) and 358468027 (CAWR-14-86880), the non-compliance had no adverse impact on the data. All analytes were within the established retention time windows for this method.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD(s) between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 358776004 (WST14-14-86623) was selected for analysis as the matrix spike. A matrix spike duplicate was not extracted or analyzed with this batch. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**Matrix Spike (MS) Recovery Statement**
The MS(1203185726) did not meet spike recovery acceptance criteria for Pentachlorophenol. There was no MSD extracted and analyzed with the parent sample. The LCS and LCSD met the acceptance criteria for Pentachlorophenol. Pentachlorophenol was not detected in the associated parent sample. Since there is insufficient sample volume remaining to re-extract the parent sample with a MS, the data results have been reported for samples 358468004 (CAWR-14-86935), 358468010 (CAWR-14-86939), 358468016 (CAWR-14-86874), 358468022 (CAWR-14-86875) and 358468027 (CAWR-14-86880).

**Matrix Spike Duplicate (MSD) Recovery Statement**
There was no matrix spike duplicate extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**MS/MSD Relative Percent Difference (RPD) Statement**
There are no reportable MS/MSD RDP values since a MSD was not extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control

samples were within the established retention time windows. Reported target analyte concentrations were confirmed on a dissimilar column.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information**

**Electronic Package Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1344246.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this Herbicide fraction.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the LCSD are from the same analytical column as the LCS. The data reported for the MS are from the same analytical column as the parent sample.

Due to rounding differences in the calculation between the forms, the data reported in the Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**System Configuration**

The Semi-Volatiles-HERB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| ECD3A.I_1 | Agilent 7890A GC with duel uECD | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD3A.I_2 | Agilent 7890A GC with duel uECD | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticideII) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

E  Concentration of the target analyte exceeds the instrument calibration range

P  Organics--The concentrations between the primary and confirmation columns/detectors is >40% different.  For HPLC, the difference is >70%.

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 28 OCT 2014**  **Title: Data Validator**

# Sample Data Summary

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 09:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468004** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86935** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 14:17** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **940 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1408.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1408.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.266 | ug/L | 0.0886 | 0.266 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.68 | 5.32 | ug/L | 107 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468010** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86939** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 14:43** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **950 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1409.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1409.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.263 | ug/L | 0.0877 | 0.263 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.41 | 5.26 | ug/L | 103 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468016** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86874** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 15:10** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **940 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1410.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1410.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.266 | ug/L | 0.0886 | 0.266 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.17 | 5.32 | ug/L | 97.3 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468022** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86875** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 15:36** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **960 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1411.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1411.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.260 | ug/L | 0.0868 | 0.260 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.63 | 5.21 | ug/L | 88.9 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **W** |
| **Lab Sample ID:** | **358468027** | **Date Received:** | **10/08/2014 09:00** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-86880** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 16:03** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **960 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1412.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1412.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.260 | ug/L | 0.0868 | 0.260 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.41 | 5.21 | ug/L | 104 | (40%-138%) |

# Quality Control Summary

**Herbicide**

## Surrogate Recovery Report

**SDG Number: 2015-40**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCAA 1 %REC # | DCAA 2 %REC # |
|---|---|---|---|
| 1203185724 | MB for batch 1426584 | 93 | 93 |
| 1203185725 | LCS for batch 1426584 | 102 | 102 |
| 1203185731 | LCSD for batch 1426584 | 88 | 99 |
| 358468004 | CAWR-14-86935 | 96 | 107 |
| 358468010 | CAWR-14-86939 | 84 | 103 |
| 358468016 | CAWR-14-86874 | 97 | 96 |
| 358468022 | CAWR-14-86875 | 89 | 89 |
| 358468027 | CAWR-14-86880 | 101 | 104 |
| 1203185726 | WST14-14-86623MS | 96 | 92 |

| Surrogate | Acceptance Limits |
|---|---|
| DCAA = 2,4-Dichlorophenylacetic acid | (40%-138%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCS for batch 1426584**
**Lab Sample ID** **1203185725**
**Instrument:** **ECD3A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **10/14/2014 12:58**
**Prep Batch ID:** **1426584**
**Batch ID:** **1426585**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 87-86-5 | LCS | Pentachlorophenol | 2.00 | 0.0 | 1.90 | 95 | 55-113 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **LCSD for batch 1426584**
**Lab Sample ID** **1203185731**
**Instrument:** **ECD3A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **10/14/2014 13:24**
**Dilution: 1**
**Prep Batch ID:** **1426584**
**Batch ID:** **1426585**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | LCSD Pentachlorophenol | 2.00 | 0.0 | 1.80 | 90 | 55-113 | 5 | 0-30 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-40**
**Client ID:** **WST14-14-86623MS**
**Lab Sample ID** **1203185726**
**Instrument:** **ECD3A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **10/14/2014 17:35**
**Prep Batch ID:** **1426584**
**Batch ID:** **1426585**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | MS | Pentachlorophenol | 2.13 | 0.00 | U | 0.381 | 18 * | 24-119 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1426584** | **Instrument ID:** | **ECD3A.I_1**<br>**ECD3A.I_2** | **Data File:** | **101414\e3j1404.D**<br>**101414\e3j1404.D** |
| **Lab Sample ID:** | **1203185724** | | | | |
| **Column:** | **RTX-CLPEST 1**<br>**RTX-CLPEST 2** | **Prep Date:** | **10/13/2014 06:40** | **Analyzed:** | **10/14/14 12:31** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1426584** | **1203185725** | **101414\e3j1405.D**<br>**101414\e3j1405.D** | **10/14/14** | **1258** |
| **02 LCSD for batch 1426584** | **1203185731** | **101414\e3j1406.D**<br>**101414\e3j1406.D** | **10/14/14** | **1324** |
| **03 CAWR-14-86935** | **358468004** | **101414\e3j1408.D**<br>**101414\e3j1408.D** | **10/14/14** | **1417** |
| **04 CAWR-14-86939** | **358468010** | **101414\e3j1409.D**<br>**101414\e3j1409.D** | **10/14/14** | **1443** |
| **05 CAWR-14-86874** | **358468016** | **101414\e3j1410.D**<br>**101414\e3j1410.D** | **10/14/14** | **1510** |
| **06 CAWR-14-86875** | **358468022** | **101414\e3j1411.D**<br>**101414\e3j1411.D** | **10/14/14** | **1536** |
| **07 CAWR-14-86880** | **358468027** | **101414\e3j1412.D**<br>**101414\e3j1412.D** | **10/14/14** | **1603** |
| **08 WST14-14-86623MS** | **1203185726** | **101414\e3j1416.D**<br>**101414\e3j1416.D** | **10/14/14** | **1735** |

# Quality Control Data

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185724** | | | | |
| **Client Sample:** | **QC for batch 1426584** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1426584** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 12:31** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1404.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1404.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.250 | ug/L | 0.0833 | 0.250 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.67 | 5.00 | ug/L | 93.4 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185725** | | | | |
| **Client Sample:** | **QC for batch 1426584** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1426584** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 12:58** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1405.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1405.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.90 | ug/L | 0.0833 | 0.250 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.12 | 5.00 | ug/L | 102 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | **Date Collected:** | **10/08/2014 12:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203185726** | **Date Received:** | **10/10/2014 09:05** | | |
| **Client Sample:** | **QC for batch 1426584** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST14-14-86623MS** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 17:35** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **940 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1416.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1416.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | P | 0.381 | ug/L | 0.0886 | 0.266 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.09 | 5.32 | ug/L | 95.8 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-40** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203185731** | | | | |
| **Client Sample:** | **QC for batch 1426584** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1426584** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1426585** | **Inst:** | **ECD3A.I** | **Dilution:** | **1** |
| **Run Date:** | **10/14/2014 13:24** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **10/13/2014 06:40** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **101414\e3j1406.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **101414\e3j1406.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.80 | ug/L | 0.0833 | 0.250 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 4.93 | 5.00 | ug/L | 98.7 | (40%-138%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 15-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| GC/ECD | SW846 8151A | Liquid | ESHL, UCOR |
| **Batch ID:** | **Sample Numbers:** | | |
| 1426585 | See Below | | |

**Potentially affected work order(s)(SDG): 358424,358468(2015-40),358776(2015-59)**

**Application Issues:**

Failed Recovery for MS/PS

Failed Yield for Surrogates

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Sample 358776004 did not meet surrogate recovery acceptance criteria. | 1. The associated MS was well within the acceptance criteria for surrogate. Since there is insufficient sample volume remaining to re-extract the parent sample with a MS, the data results have been reported. |
| 2. The MS(1203185726) did not meet spike recovery acceptance criteria for MCPP and Pentachlorophenol. | 2. There was no MSD extracted and analyzed with the parent sample. The LCS and LCSD met the acceptance criteria for MCPP and Pentachlorophenol. MCPP and Pentachlorophenol were not detected in the associated parent sample and the biased high spike recoveries had no adverse impact on the data. Since there is insufficient sample volume remaining to re-extract the parent sample with a MS, the data results have been reported. |

**Originator's Name:**

Lindsey Jensen 15-OCT-14

**Data Validator/Group Leader:**

Barbara Bailey 28-OCT-14

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

| **Sample ID** | **Client ID** |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468005 | CAWR-14-86962 |
| 358468012 | CAWR-14-86939 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 358468030 | CAWR-14-86884 |
| 1203184131 | Method Blank (MB)**ICP** |
| 1203184132 | Laboratory Control Sample (LCS) |
| 1203184135 | 358468005(CAWR-14-86962L) Serial Dilution (SD) |
| 1203184133 | 358468005(CAWR-14-86962D) Sample Duplicate (DUP) |
| 1203184134 | 358468005(CAWR-14-86962S) Matrix Spike (MS) |
| 1203184081 | Method Blank (MB)**ICP-MS** |
| 1203184082 | Laboratory Control Sample (LCS) |
| 1203184625 | 358468005(CAWR-14-86962L) Serial Dilution (SD) |
| 1203184623 | 358468005(CAWR-14-86962D) Sample Duplicate (DUP) |
| 1203184624 | 358468005(CAWR-14-86962S) Matrix Spike (MS) |
| 1203185025 | Method Blank (MB)**CVAA** |
| 1203185026 | Laboratory Control Sample (LCS) |
| 1203185029 | 358468003(CAWR-14-86935L) Serial Dilution (SD) |
| 1203185027 | 358468003(CAWR-14-86935D) Sample Duplicate (DUP) |
| 1203185028 | 358468003(CAWR-14-86935S) Matrix Spike (MS) |

**Sample Analysis**

**Method/Analysis Information**

| | |
|---|---|
| **Analytical Batch:** | 1425927, 1426078, 1426297 and 1433098 |
| **Prep Batch :** | 1425926, 1425905 and 1426296 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 11, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 28 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories,

LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**System Configuration**

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1600W power, 16 L/m for the plasma, and 1.2 L/m auxiliary gases, and 1.12 L/min carrier gas flow.

**Calibration Information**

**Instrument Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL/PQL Requirements**
The CRDL/PQL standard recoveries met the referenced advisory control limits.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blanks (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 358468005 (CAWR-14-86962)-ICP and ICP-MS and 358468003 (CAWR-14-86935)-CVAA.

**Matrix Spike (MS) Recovery Statement**

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Potassium did not meet the established percent difference criteria. 1203184135 (CAWR-14-86962)-ICP.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples required dilutions for tin in order to minimize suppression due to matrix interferences. 358468005 (CAWR-14-86962), 358468013 (CAWR-14-86966) and 358468030 (CAWR-14-86884)-ICP.

**Preparation Information**
The samples in this SDG were prepared exactly according to the cited SOP.

**Miscellaneous Information**

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

**Additional Comments**
Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

E  %difference of sample and SD is >10%.  Sample concentration must meet flagging criteria

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by Nik-Cole A. Elmore 11.4.14

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 358468003 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86935 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/14/14 10:09 | 101414W1−10 | 1426297 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1426297 | 1426296 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/13/14 | JXM5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 358468005 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86962 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/14/14 10:18 | 101414W1−10 | 1426297 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 358468005 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86962 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7440−38−2 | Arsenic | 5 | ug/L | U | 1.7 | 5 | 5 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7440−39−3 | Barium | 115 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−42−8 | Boron | 52.1 | ug/L | | 15 | 50 | 50 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7440−70−2 | Calcium | 36300 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−47−3 | Chromium | 2.21 | ug/L | J | 2 | 10 | 10 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7439−95−4 | Magnesium | 1080 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7439−98−7 | Molybdenum | 1.27 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7440−02−0 | Nickel | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7440−09−7 | Potassium | 2630 | ug/L | E | 50 | 150 | 150 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7631−86−9 | Silica | 29100 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7440−23−5 | Sodium | 29400 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−24−6 | Strontium | 823 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 11/01/14 13:48 | 141101−2 | 1426078 |
| 7440−31−5 | Tin | 50 | ug/L | U | 12.5 | 50 | 50 | 5 | P | HSC | 10/29/14 18:20 | 102914−1 | 1425927 |
| 7440−61−1 | Uranium | 10.6 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 11/02/14 10:04 | 141101−9 | 1426078 |
| 7440−62−2 | Vanadium | 3.33 | ug/L | J | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 10/29/14 09:35 | 102914−1 | 1425927 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 358468005 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86962 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 95 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/03/14 17:31 | | 1433098 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1426078 | 1425905 | SW846 3005A | 50 | mL | 50 | mL | 10/14/14 | JP1 |
| 1425927 | 1425926 | SW846 3005A | 50 | mL | 50 | mL | 10/09/14 | JP1 |
| 1426297 | 1426296 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/13/14 | JXM5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 358468012 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86939 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/14/14 10:19 | 101414W1−10 | 1426297 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1426297 | 1426296 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/13/14 | JXM5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 358468013 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86966 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/14/14 10:21 | 101414W1−10 | 1426297 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 358468013 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86966 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7440−38−2 | Arsenic | 3.56 | ug/L | J | 1.7 | 5 | 5 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7440−39−3 | Barium | 77.3 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−42−8 | Boron | 32.8 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7440−70−2 | Calcium | 38100 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−47−3 | Chromium | 10 | ug/L | U | 2 | 10 | 10 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7439−95−4 | Magnesium | 6690 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7439−96−5 | Manganese | 7.14 | ug/L | J | 2 | 10 | 10 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7439−98−7 | Molybdenum | 5.73 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7440−02−0 | Nickel | 0.647 | ug/L | J | 0.5 | 2 | 2 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7440−09−7 | Potassium | 2640 | ug/L | E | 50 | 150 | 150 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7631−86−9 | Silica | 20500 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7440−23−5 | Sodium | 18700 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−24−6 | Strontium | 306 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 11/01/14 13:59 | 141101−2 | 1426078 |
| 7440−31−5 | Tin | 50 | ug/L | U | 12.5 | 50 | 50 | 5 | P | HSC | 10/29/14 18:13 | 102914−1 | 1425927 |
| 7440−61−1 | Uranium | 1.84 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 11/02/14 10:09 | 141101−9 | 1426078 |
| 7440−62−2 | Vanadium | 4.53 | ug/L | J | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 10/29/14 09:26 | 102914−1 | 1425927 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 358468013 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86966 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 123 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/03/14 17:31 | | 1433098 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1426078 | 1425905 | SW846 3005A | 50 | mL | 50 | mL | 10/14/14 | JP1 |
| 1425927 | 1425926 | SW846 3005A | 50 | mL | 50 | mL | 10/09/14 | JP1 |
| 1426297 | 1426296 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/13/14 | JXM5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 358468019 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86874 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/14/14 10:26 | 101414W1−10 | 1426297 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 358468019 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86874 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7440−38−2 | Arsenic | 1.72 | ug/L | J | 1.7 | 5 | 5 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7440−39−3 | Barium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−42−8 | Boron | 50 | ug/L | U | 15 | 50 | 50 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7440−70−2 | Calcium | 200 | ug/L | U | 50 | 200 | 200 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−47−3 | Chromium | 10 | ug/L | U | 2 | 10 | 10 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7439−95−4 | Magnesium | 300 | ug/L | U | 110 | 300 | 300 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7439−96−5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7439−98−7 | Molybdenum | 0.50 | ug/L | U | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7440−02−0 | Nickel | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7440−09−7 | Potassium | 150 | ug/L | UE | 50 | 150 | 150 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7631−86−9 | Silica | 592 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7440−23−5 | Sodium | 300 | ug/L | U | 100 | 300 | 300 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−24−6 | Strontium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 11/01/14 14:01 | 141101−2 | 1426078 |
| 7440−31−5 | Tin | 10 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−61−1 | Uranium | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 11/02/14 10:11 | 141101−9 | 1426078 |
| 7440−62−2 | Vanadium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 10/29/14 09:29 | 102914−1 | 1425927 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 358468019 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86874 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 1.24 | mg/L | U | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/03/14 17:31 | | 1433098 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1426078 | 1425905 | SW846 3005A | 50 | mL | 50 | mL | 10/14/14 | JP1 |
| 1425927 | 1425926 | SW846 3005A | 50 | mL | 50 | mL | 10/09/14 | JP1 |
| 1426297 | 1426296 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/13/14 | JXM5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 358468029 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86880 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/14/14 10:28 | 101414W1−10 | 1426297 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1426297 | 1426296 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/13/14 | JXM5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 358468030 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86884 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 10/14/14 10:30 | 101414W1−10 | 1426297 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 358468030 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86884 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7440−38−2 | Arsenic | 3.3 | ug/L | J | 1.7 | 5 | 5 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7440−39−3 | Barium | 78.1 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−42−8 | Boron | 32.3 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7440−70−2 | Calcium | 38600 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−47−3 | Chromium | 10 | ug/L | U | 2 | 10 | 10 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7439−89−6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7439−95−4 | Magnesium | 6750 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7439−96−5 | Manganese | 6.16 | ug/L | J | 2 | 10 | 10 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7439−98−7 | Molybdenum | 5.64 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7440−02−0 | Nickel | 0.588 | ug/L | J | 0.5 | 2 | 2 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7440−09−7 | Potassium | 2660 | ug/L | E | 50 | 150 | 150 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7631−86−9 | Silica | 20600 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7440−23−5 | Sodium | 19200 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−24−6 | Strontium | 312 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | BAJ | 11/01/14 14:03 | 141101−2 | 1426078 |
| 7440−31−5 | Tin | 50 | ug/L | U | 12.5 | 50 | 50 | 5 | P | HSC | 10/29/14 18:16 | 102914−1 | 1425927 |
| 7440−61−1 | Uranium | 1.82 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | BAJ | 11/02/14 10:12 | 141101−9 | 1426078 |
| 7440−62−2 | Vanadium | 4.38 | ug/L | J | 1 | 5 | 5 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 10/29/14 09:32 | 102914−1 | 1425927 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−40 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 358468030 **BASIS:** As Received **DATE COLLECTED** 06−OCT−14

**CLIENT ID:** CAWR−14−86884 **LEVEL:** Low **DATE RECEIVED** 08−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 124 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/03/14 17:31 | | 1433098 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1426078 | 1425905 | SW846 3005A | 50 | mL | 50 | mL | 10/14/14 | JP1 |
| 1425927 | 1425926 | SW846 3005A | 50 | mL | 50 | mL | 10/09/14 | JP1 |
| 1426297 | 1426296 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 10/13/14 | JXM5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2015−40

**Contract:** ESHL00714

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203184081 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.85 | ug/L | +/−5 | J | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203184131 | | | | | | | | |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 50 | ug/L | +/−150 | U | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 100 | ug/L | +/−300 | U | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| 1203185025 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−40 **Client ID** CAWR−14−86962S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 358468005 **Spike ID:** 1203184134

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Beryllium | ug/L | 75−125 | 506 | | 1 | U | 500 | 101 | | P |
| Boron | ug/L | 75−125 | 558 | | 52.1 | | 500 | 101 | | P |
| Calcium | ug/L | | 42100 | | 36300 | | 5000 | 117 | N/A | P |
| Cobalt | ug/L | 75−125 | 491 | | 1 | U | 500 | 98.1 | | P |
| Copper | ug/L | 75−125 | 508 | | 3 | U | 500 | 102 | | P |
| Iron | ug/L | 75−125 | 5160 | | 30 | U | 5000 | 103 | | P |
| Magnesium | ug/L | 75−125 | 6240 | | 1080 | | 5000 | 103 | | P |
| Manganese | ug/L | 75−125 | 495 | | 2 | U | 500 | 98.9 | | P |
| Potassium | ug/L | 75−125 | 7810 | | 2630 | | 5000 | 104 | | P |
| Silica | ug/L | 75−125 | 40100 | | 29100 | | 10700 | 103 | | P |
| Sodium | ug/L | | 34900 | | 29400 | | 5000 | 110 | N/A | P |
| Strontium | ug/L | 75−125 | 1330 | | 823 | | 500 | 102 | | P |
| Tin | ug/L | 75−125 | 490 | | 12.5 | U | 500 | 98 | | P |
| Vanadium | ug/L | 75−125 | 529 | | 3.33 | J | 500 | 105 | | P |
| Zinc | ug/L | 75−125 | 502 | | 3.3 | U | 500 | 100 | | P |
| Aluminum | ug/L | 75−125 | 5050 | | 68 | U | 5000 | 100 | | P |
| Barium | ug/L | 75−125 | 616 | | 115 | | 500 | 100 | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−40 **Client ID** CAWR−14−86962S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 358468005 **Spike ID:** 1203184624

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | 75−125 | 50.1 | | 1 | U | 50 | 99.5 | | MS |
| Arsenic | ug/L | 75−125 | 54.9 | | 1.7 | U | 50 | 107 | | MS |
| Cadmium | ug/L | 75−125 | 50.4 | | 0.11 | U | 50 | 101 | | MS |
| Chromium | ug/L | 75−125 | 53.2 | | 2.21 | J | 50 | 102 | | MS |
| Lead | ug/L | 75−125 | 51.4 | | 0.5 | U | 50 | 103 | | MS |
| Molybdenum | ug/L | 75−125 | 53.8 | | 1.27 | | 50 | 105 | | MS |
| Nickel | ug/L | 75−125 | 49.7 | | 0.5 | U | 50 | 99.3 | | MS |
| Selenium | ug/L | 75−125 | 54.6 | | 1.5 | U | 50 | 107 | | MS |
| Silver | ug/L | 75−125 | 52 | | 0.2 | U | 50 | 104 | | MS |
| Thallium | ug/L | 75−125 | 49.5 | | 0.45 | U | 50 | 99.1 | | MS |
| Uranium | ug/L | 75−125 | 60.9 | | 10.6 | | 50 | 101 | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−40 **Client ID** CAWR−14−86935S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 358468003 **Spike ID:** 1203185028

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 1.97 | | 0.067 | U | 2 | 98.4 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−40 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CAWR−14−86962D

**Matrix:** WATER **Level:** Low

**Sample ID:** 358468005 **Duplicate ID:** 1203184133 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−20% | 115 | | 116 | | 1.06 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | +/−50 | 52.1 | | 52.5 | | .722 | | P |
| Calcium | ug/L | +/−20% | 36300 | | 36900 | | 1.77 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−300 | 1080 | | 1110 | | 2.62 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 2630 | | 2660 | | 1.38 | | P |
| Silica | ug/L | +/−20% | 29100 | | 29400 | | 1.09 | | P |
| Sodium | ug/L | +/−20% | 29400 | | 29400 | | 0 | | P |
| Strontium | ug/L | +/−20% | 823 | | 834 | | 1.33 | | P |
| Tin | ug/L | | 12.5 | U | 12.5 | U | | | P |
| Vanadium | ug/L | +/−5 | 3.33 | J | 3.54 | J | 6 | | P |
| Zinc | ug/L | | 3.3 | U | 3.3 | U | | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−40 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CAWR−14−86962D

**Matrix:** WATER **Level:** Low

**Sample ID:** 358468005 **Duplicate ID:** 1203184623 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | | 1.7 | U | 2.8 | J | 200 | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | +/−10 | 2.21 | J | 2.2 | J | .181 | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 1.27 | | 1.25 | | 1.27 | | MS |
| Nickel | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−20% | 10.6 | | 10.7 | | 1.11 | | MS |

***Analytical Methods:**

**MS SW846 3005A/6020A**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−40 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CAWR−14−86935D

**Matrix:** WATER **Level:** Low

**Sample ID:** 358468003 **Duplicate ID:** 1203185027 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−40

**Contract:** ESHL00714

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203184082 | | | | | | | | |
| | Antimony | ug/L | 50 | 52.7 | | 105 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 53.7 | | 107 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 52.5 | | 105 | 80−120 | MS |
| | Chromium | ug/L | 50 | 51.3 | | 103 | 80−120 | MS |
| | Lead | ug/L | 50 | 51.5 | | 103 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 52.7 | | 105 | 80−120 | MS |
| | Nickel | ug/L | 50 | 52.2 | | 104 | 80−120 | MS |
| | Selenium | ug/L | 50 | 51.7 | | 103 | 80−120 | MS |
| | Silver | ug/L | 50 | 54.9 | | 110 | 80−120 | MS |
| | Thallium | ug/L | 50 | 50 | | 100 | 80−120 | MS |
| | Uranium | ug/L | 50 | 49.4 | | 98.8 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−40

**Contract:** ESHL00714

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203184132 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 4850 | | 97 | 80−120 | P |
| | Barium | ug/L | 500 | 507 | | 101 | 80−120 | P |
| | Beryllium | ug/L | 500 | 501 | | 100 | 80−120 | P |
| | Boron | ug/L | 500 | 494 | | 98.7 | 80−120 | P |
| | Calcium | ug/L | 5000 | 4930 | | 98.6 | 80−120 | P |
| | Cobalt | ug/L | 500 | 511 | | 102 | 80−120 | P |
| | Copper | ug/L | 500 | 505 | | 101 | 80−120 | P |
| | Iron | ug/L | 5000 | 5080 | | 102 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 5120 | | 102 | 80−120 | P |
| | Manganese | ug/L | 500 | 509 | | 102 | 80−120 | P |
| | Potassium | ug/L | 5000 | 4970 | | 99.4 | 80−120 | P |
| | Silica | ug/L | 10700 | 10400 | | 96.9 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5110 | | 102 | 80−120 | P |
| | Strontium | ug/L | 500 | 498 | | 99.6 | 80−120 | P |
| | Tin | ug/L | 500 | 503 | | 101 | 80−120 | P |
| | Vanadium | ug/L | 500 | 522 | | 104 | 80−120 | P |
| | Zinc | ug/L | 500 | 509 | | 102 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−40

**Contract:** ESHL00714

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203185026 | | | | | | | | |
| | Mercury | ug/L | 2 | 2.03 | | 101 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−40 **Client ID** CAWR−14−86962L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 358468005 **Serial Dilution ID:** 1203184135

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 115 | | 117 | | 1.67 | | 10 | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 52.1 | | 75 | U | 100 | | | P |
| Calcium | 36300 | | 37000 | | 1.93 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 1080 | | 1130 | J | 5 | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 2630 | | 2940 | | 12 | E | 10 | P |
| Silica | 29100 | | 29100 | | .251 | | 10 | P |
| Sodium | 29400 | | 30000 | | 2.06 | | 10 | P |
| Strontium | 823 | | 838 | | 1.8 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 3.33 | J | 5 | U | 100 | | | P |
| Zinc | 3.3 | U | 16.5 | U | | | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−40 **Client ID** CAWR−14−86962L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 358468005 **Serial Dilution ID:** 1203184625

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 1.7 | U | 8.5 | U | | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 2.21 | J | 10 | U | 100 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | 1.27 | | 1.45 | J | 14.3 | | | MS |
| Nickel | .5 | U | 2.5 | U | | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | 10.6 | | 10.1 | | 3.95 | | 10 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−40 **Client ID** CAWR−14−86935L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 358468003 **Serial Dilution ID:** 1203185029

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1425832 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203183925 | Method Blank (MB) |
| 1203183926 | Laboratory Control Sample (LCS) |
| 1203183927 | 358468003(CAWR-14-86935) Sample Duplicate (DUP) |
| 1203183928 | 358000003(CAWR-14-86932) Sample Duplicate (DUP) |
| 1203183929 | 358468003(CAWR-14-86935) Post Spike (PS) |
| 1203183930 | 358000003(CAWR-14-86932) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 358000003 (CAWR-14-86932) and 358468003 (CAWR-14-86935).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
A 15 mg/L Total Inorganic Carbon check standard is analyzed with each analytical run to prove that the instrument is effectively sparging away the inorganic carbon.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1425872 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1425871 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203184006 | Method Blank (MB) |
| 1203184007 | Laboratory Control Sample (LCS) |
| 1203184009 | 358468003(CAWR-14-86935) Sample Duplicate (DUP) |
| 1203184012 | 358468003(CAWR-14-86935) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 358468003 (CAWR-14-86935).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203184009 (CAWR-14-86935).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1426694 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203185916 | Method Blank (MB) |
| 1203185917 | Laboratory Control Sample (LCS) |
| 1203185918 | 358468005(CAWR-14-86962) Sample Duplicate (DUP) |
| 1203185919 | 358468005(CAWR-14-86962) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 358468005 (CAWR-14-86962).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 358468013 (CAWR-14-86966) and 358468030 (CAWR-14-86884).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203185918 (CAWR-14-86962), 1203185919 (CAWR-14-86962), 358468005 (CAWR-14-86962), 358468013 (CAWR-14-86966) and 358468019 (CAWR-14-86874).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1425369 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1425368 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203182735 | Method Blank (MB) |
| 1203182736 | Laboratory Control Sample (LCS) |
| 1203182737 | 358468005(CAWR-14-86962) Sample Duplicate (DUP) |
| 1203182738 | 358468005(CAWR-14-86962) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 358468005 (CAWR-14-86962).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203182737 (CAWR-14-86962).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following samples were re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported. 1203182737 (CAWR-14-86962), 1203182738 (CAWR-14-86962), 358468005 (CAWR-14-86962), 358468013 (CAWR-14-86966), 358468019 (CAWR-14-86874) and 358468030 (CAWR-14-86884).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1342542. 1203182737 (CAWR-14-86962).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1425371 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1425370 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203182739 | Method Blank (MB) |
| 1203182740 | Laboratory Control Sample (LCS) |
| 1203182741 | 358468003(CAWR-14-86935) Sample Duplicate (DUP) |
| 1203182742 | 358468003(CAWR-14-86935) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 358468003 (CAWR-14-86935).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203182742 (CAWR-14-86935).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1343827. 1203182742 (CAWR-14-86935).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1425672 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203183539 | Method Blank (MB) |
| 1203183540 | Laboratory Control Sample (LCS) |
| 1203183541 | 358468005(CAWR-14-86962) Sample Duplicate (DUP) |
| 1203183543 | 358468005(CAWR-14-86962) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 358468005 (CAWR-14-86962).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203183541 (CAWR-14-86962), 1203183543 (CAWR-14-86962) and 358468005 (CAWR-14-86962).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Method/Analysis Information**

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1425671 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1425670 | **Method:** | EEPA 365.4 Prep |

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203183533 | Method Blank (MB) |
| 1203183534 | Laboratory Control Sample (LCS) |
| 1203183537 | 358468005(CAWR-14-86962) Sample Duplicate (DUP) |
| 1203183538 | 358468005(CAWR-14-86962) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**Calibration Information**

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 358468005 (CAWR-14-86962).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1425713 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203183646 | Method Blank (MB) |
| 1203183647 | Laboratory Control Sample (LCS) |
| 1203183648 | 358468005(CAWR-14-86962) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 358468005 (CAWR-14-86962).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203183648 (CAWR-14-86962).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1343273. 1203183648 (CAWR-14-86962).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1426404 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203185286 | Laboratory Control Sample (LCS) |
| 1203185287 | 358000013(CAWR-14-86961) Sample Duplicate (DUP) |
| 1203185288 | 358468013(CAWR-14-86966) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

**Initial Standardization**
The titrant was properly standardized

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
N/A

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1427923 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203188998 | Laboratory Control Sample (LCS) |
| 1203189000 | 358008023(CAWR-14-86977) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
N/A

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
The following samples from this sample group were received by the lab outside of the method specified holding time: 358468005 (CAWR-14-86962), 358468013 (CAWR-14-86966), 358468019 (CAWR-14-86874) and 358468030 (CAWR-14-86884).

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

## Miscellaneous Information

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1345485. 358468005 (CAWR-14-86962), 358468013 (CAWR-14-86966), 358468019 (CAWR-14-86874) and 358468030 (CAWR-14-86884).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1427930 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 358468005 | CAWR-14-86962 |
| 358468013 | CAWR-14-86966 |
| 358468019 | CAWR-14-86874 |
| 358468030 | CAWR-14-86884 |
| 1203189008 | Method Blank (MB) |
| 1203189010 | Laboratory Control Sample (LCS) |
| 1203189015 | 358468005(CAWR-14-86962) Sample Duplicate (DUP) |
| 1203189019 | 358468005(CAWR-14-86962) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 358468005 (CAWR-14-86962).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____04Nov14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

E  Concentration of the target analyte exceeds the instrument calibration range

H  Analytical holding time was exceeded

J  Value is estimated

P  Organics--The concentrations between the primary and confirmation columns/detectors is >40% different.  For HPLC, the difference is >70%.

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

UI  Gamma Spectroscopy--Uncertain identification

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 3, 2014

| | |
|---|---|
| Company : | Los Alamos National Laboratory |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 |
| | Los Alamos, New Mexico 87545 |
| Contact: | Mr. Keith Greene |
| Project: | LANL-WQH Groundwater Samples |

Client SDG: 2015-40

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-86935 | Project: | ESHL00714 |
| Sample ID: | 358468003 | Client ID: | ARSL004 |
| Matrix: | W | | |
| Collect Date: | 06-OCT-14 09:40 | | |
| Receive Date: | 08-OCT-14 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | J | 0.570 | 0.330 | 1.00 | mg/L | 1 | TSM | 10/10/14 | 2026 | 1425832 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 10/10/14 | 0819 | 1425872 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.266 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 10/14/14 | 1351 | 1425371 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 10/09/14 | 1528 | 1425871 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 10/13/14 | 1700 | 1425370 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 3, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2015-40

Client Sample ID: CAWR-14-86962
Sample ID: 358468005
Matrix: W
Collect Date: 06-OCT-14 09:40
Receive Date: 08-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | J | 0.133 | 0.067 | 0.200 | mg/L | 1 | MAR1 | 10/28/14 | 1223 | 1426694 | 1 |
| Chloride | | 7.29 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.189 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 14.2 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.148 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/09/14 | 1505 | 1425369 | 2 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 2.33 | 0.085 | 0.250 | mg/L | 5 | AXH3 | 10/22/14 | 0951 | 1425672 | 3 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | | 0.0712 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/14/14 | 1111 | 1425671 | 4 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 214 | 3.40 | 14.3 | mg/L | | MXB3 | 10/09/14 | 1136 | 1425713 | 5 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 21.0C | H | 8.02 | 0.010 | 0.100 | SU | 1 | PXO1 | 10/17/14 | 1313 | 1427923 | 6 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 128 | 0.725 | 1.00 | mg/L | | PXO1 | 10/16/14 | 1726 | 1427930 | 7 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 300 | 3.63 | 14.5 | umhos/cm | 1 | PXO1 | 10/10/14 | 1508 | 1426404 | 8 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 10/09/14 | 1155 | 1425368 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 10/13/14 | 1700 | 1425670 |

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## Certificate of Analysis

Report Date: November 3, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2015-40 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-86962 | Project: | ESHL00714 |
| Sample ID: | 358468005 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 350.1 | |
| 3 | EPA 353.2 | |
| 4 | EPA 365.4 | |
| 5 | EPA 160.1 | |
| 6 | EPA 150.1 | |
| 7 | EPA 310.1 | |
| 8 | EPA 120.1 | |

**Notes:**

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## Certificate of Analysis

Report Date: November 3, 2014

| | |
|---|---|
| Company : | Los Alamos National Laboratory |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 |
| | Los Alamos, New Mexico 87545 |
| Contact: | Mr. Keith Greene |
| Project: | LANL-WQH Groundwater Samples |

Client SDG: 2015-40

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-86939 | Project: | ESHL00714 |
| Sample ID: | 358468012 | Client ID: | ARSL004 |
| Matrix: | W | | |
| Collect Date: | 06-OCT-14 10:55 | | |
| Receive Date: | 08-OCT-14 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 2.69 | 0.330 | 1.00 | mg/L | 1 | TSM | 10/10/14 | 2128 | 1425832 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 10/10/14 | 0822 | 1425872 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.560 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 10/14/14 | 1354 | 1425371 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 10/09/14 | 1528 | 1425871 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 10/13/14 | 1700 | 1425370 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 3, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2015-40

Client Sample ID: CAWR-14-86966
Sample ID: 358468013
Matrix: W
Collect Date: 06-OCT-14 10:55
Receive Date: 08-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | 1 | MAR1 | 10/28/14 | 1350 | 1426694 | 1 |
| Chloride | | 4.77 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.322 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 46.0 | 0.665 | 2.00 | mg/L | 5 | MAR1 | 10/30/14 | 0227 | 1426694 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.0682 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/09/14 | 1507 | 1425369 | 3 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.0723 | 0.017 | 0.050 | mg/L | 1 | AXH3 | 10/22/14 | 1000 | 1425672 | 4 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | J | 0.0417 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/14/14 | 1118 | 1425671 | 5 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 189 | 3.40 | 14.3 | mg/L | | MXB3 | 10/09/14 | 1136 | 1425713 | 6 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 21.1C | H | 8.17 | 0.010 | 0.100 | SU | 1 | PXO1 | 10/17/14 | 1317 | 1427923 | 7 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 107 | 0.725 | 1.00 | mg/L | | PXO1 | 10/16/14 | 1738 | 1427930 | 8 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 305 | 3.63 | 14.5 | umhos/cm | 1 | PXO1 | 10/10/14 | 1510 | 1426404 | 9 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 10/09/14 | 1155 | 1425368 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 10/13/14 | 1700 | 1425670 |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 3, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2015-40 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-86966 | Project: | ESHL00714 |
| Sample ID: | 358468013 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 300.0 | |
| 3 | EPA 350.1 | |
| 4 | EPA 353.2 | |
| 5 | EPA 365.4 | |
| 6 | EPA 160.1 | |
| 7 | EPA 150.1 | |
| 8 | EPA 310.1 | |
| 9 | EPA 120.1 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: November 3, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2015-40

Client Sample ID: CAWR-14-86874
Sample ID: 358468019
Matrix: W
Collect Date: 06-OCT-14 12:35
Receive Date: 08-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 19.2 | 0.330 | 1.00 | mg/L | 1 | TSM | 10/10/14 | 2201 | 1425832 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 10/10/14 | 0826 | 1425872 | 2 |
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | 1 | MAR1 | 10/28/14 | 1419 | 1426694 | 3 |
| Chloride | U | ND | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | U | ND | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | U | ND | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.0626 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/09/14 | 1508 | 1425369 | 4 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | U | ND | 0.017 | 0.050 | mg/L | 1 | AXH3 | 10/22/14 | 1001 | 1425672 | 5 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | J | 0.0297 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/14/14 | 1119 | 1425671 | 6 |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.033 | 0.100 | mg/L | 1 | KLP1 | 10/14/14 | 1355 | 1425371 | 7 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | U | ND | 3.40 | 14.3 | mg/L | | MXB3 | 10/09/14 | 1136 | 1425713 | 8 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 20.8C | H | 6.09 | 0.010 | 0.100 | SU | 1 | PXO1 | 10/17/14 | 1320 | 1427923 | 9 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | U | ND | 0.725 | 1.00 | mg/L | | PXO1 | 10/16/14 | 1741 | 1427930 | 10 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | U | ND | 3.63 | 14.5 | umhos/cm | 1 | PXO1 | 10/10/14 | 1513 | 1426404 | 11 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|

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## Certificate of Analysis

Report Date: November 3, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2015-40 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-86874 | Project: | ESHL00714 |
| Sample ID: | 358468019 | Client ID: | ARSL004 |

| | | | | | |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 10/09/14 | 1528 | 1425871 |
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 10/09/14 | 1155 | 1425368 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 10/13/14 | 1700 | 1425370 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 10/13/14 | 1700 | 1425670 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 300.0 | |
| 4 | EPA 350.1 | |
| 5 | EPA 353.2 | |
| 6 | EPA 365.4 | |
| 7 | EPA 351.2 | |
| 8 | EPA 160.1 | |
| 9 | EPA 150.1 | |
| 10 | EPA 310.1 | |
| 11 | EPA 120.1 | |

**Notes:**

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## Certificate of Analysis

Report Date: November 3, 2014

| | |
|---|---|
| Company : | Los Alamos National Laboratory |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 |
| | Los Alamos, New Mexico 87545 |
| Contact: | Mr. Keith Greene |
| Project: | LANL-WQH Groundwater Samples |

Client SDG: 2015-40

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-86880 | Project: | ESHL00714 |
| Sample ID: | 358468029 | Client ID: | ARSL004 |
| Matrix: | W | | |
| Collect Date: | 06-OCT-14 10:55 | | |
| Receive Date: | 08-OCT-14 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 2.72 | 0.330 | 1.00 | mg/L | 1 | TSM | 10/10/14 | 2253 | 1425832 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 10/10/14 | 0827 | 1425872 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.646 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 10/14/14 | 1356 | 1425371 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 10/09/14 | 1528 | 1425871 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 10/13/14 | 1700 | 1425370 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 3, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2015-40

Client Sample ID: CAWR-14-86884
Sample ID: 358468030
Matrix: W
Collect Date: 06-OCT-14 10:55
Receive Date: 08-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | 1 | MAR1 | 10/28/14 | 1448 | 1426694 | 1 |
| Chloride | | 4.78 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.319 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 46.0 | 0.665 | 2.00 | mg/L | 5 | MAR1 | 10/30/14 | 0256 | 1426694 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.0855 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/09/14 | 1509 | 1425369 | 3 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.0763 | 0.017 | 0.050 | mg/L | 1 | AXH3 | 10/22/14 | 1002 | 1425672 | 4 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | J | 0.0217 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 10/14/14 | 1120 | 1425671 | 5 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 173 | 3.40 | 14.3 | mg/L | | MXB3 | 10/09/14 | 1136 | 1425713 | 6 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 20.6C | H | 8.17 | 0.010 | 0.100 | SU | 1 | PXO1 | 10/17/14 | 1324 | 1427923 | 7 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 107 | 0.725 | 1.00 | mg/L | | PXO1 | 10/16/14 | 1744 | 1427930 | 8 |
| Carbonate alkalinity (CaCO3) | | 2.01 | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 305 | 3.63 | 14.5 | umhos/cm | 1 | PXO1 | 10/10/14 | 1515 | 1426404 | 9 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | KLP1 | 10/09/14 | 1155 | 1425368 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 10/13/14 | 1700 | 1425670 |

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## Certificate of Analysis

Report Date: November 3, 2014

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|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2015-40 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-86884 | Project: | ESHL00714 |
| Sample ID: | 358468030 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 300.0 | |
| 3 | EPA 350.1 | |
| 4 | EPA 353.2 | |
| 5 | EPA 365.4 | |
| 6 | EPA 160.1 | |
| 7 | EPA 150.1 | |
| 8 | EPA 310.1 | |
| 9 | EPA 120.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

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## QC Summary

Report Date: November 3, 2014



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **358468**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | | |
| Batch 1425832 | | | | | | | | | | | | |
| QC1203183927 358468003 DUP | | | | | | | | | | | | |
| Total Organic Carbon Average | | J | 0.570 | J | 0.656 | mg/L | 14.0 | ^ | | (+/-1.00) | TSM | 10/10/14 20:59 |
| QC1203183928 358000003 DUP | | | | | | | | | | | | |
| Total Organic Carbon Average | | | 1.05 | | 1.07 | mg/L | 1.61 | ^ | | (+/-1.00) | | 10/10/14 14:03 |
| QC1203183926 LCS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 9.86 | mg/L | | | 98.6 | (85%-115%) | | 10/10/14 13:21 |
| QC1203183925 MB | | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | | 10/10/14 13:12 |
| QC1203183929 358468003 PS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | J | 0.570 | | 11.2 | mg/L | | | 107 | (65%-120%) | | 10/10/14 21:19 |
| QC1203183930 358000003 PS | | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | 1.05 | | 11.8 | mg/L | | | 107 | (65%-120%) | | 10/10/14 14:23 |
| **Flow Injection Analysis** | | | | | | | | | | | | |
| Batch 1425872 | | | | | | | | | | | | |
| QC1203184009 358468003 DUP | | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | | AXH3 | 10/10/14 08:20 |
| QC1203184007 LCS | | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 52.4 | ug/L | | | 105 | (90%-110%) | | 10/10/14 08:03 |
| QC1203184006 MB | | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | | 10/10/14 08:01 |
| QC1203184012 358468003 MS | | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 108 | ug/L | | | 108 | (90%-110%) | | 10/10/14 08:21 |
| **Ion Chromatography** | | | | | | | | | | | | |
| Batch 1426694 | | | | | | | | | | | | |
| QC1203185918 358468005 DUP | | | | | | | | | | | | |
| Bromide | | J | 0.133 | J | 0.131 | mg/L | 2.20 | ^ | | (+/-0.200) | MAR1 | 10/28/14 12:52 |
| Chloride | | | 7.29 | | 7.29 | mg/L | 0.085 | | | (0%-20%) | | |
| Fluoride | | | 0.189 | | 0.190 | mg/L | 0.527 | ^ | | (+/-0.100) | | |
| Sulfate | | | 14.2 | | 14.2 | mg/L | 0.0218 | | | (0%-20%) | | |

## QC Summary

**Workorder:** **358468**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1426694 | | | | | | | | | | | |
| QC1203185917 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.24 | mg/L | | 98.8 | (90%-110%) | MAR1 | 10/28/14 11:54 |
| Chloride | 5.00 | | | | 4.65 | mg/L | | 92.9 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.34 | mg/L | | 93.5 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 9.54 | mg/L | | 95.4 | (90%-110%) | | |
| QC1203185916 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 10/28/14 11:25 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203185919 358468005 PS | | | | | | | | | | | |
| Bromide | 1.25 | J | 0.133 | | 1.37 | mg/L | | 99.1 | (90%-110%) | | 10/28/14 13:21 |
| Chloride | 5.00 | | 7.29 | | 12.8 | mg/L | | 110 | (90%-110%) | | |
| Fluoride | 2.50 | | 0.189 | | 2.54 | mg/L | | 93.9 | (90%-110%) | | |
| Sulfate | 10.0 | | 14.2 | | 25.1 | mg/L | | 109 | (90%-110%) | | |
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1425369 | | | | | | | | | | | |
| QC1203182737 358468005 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | | 0.148 | J | 0.0188 | mg/L | 155*^ | | (+/-0.050) | KLP1 | 10/09/14 15:06 |
| QC1203182736 LCS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 0.993 | mg/L | | 99.3 | (90%-110%) | | 10/09/14 12:59 |
| QC1203182735 MB | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | U | ND | mg/L | | | | | 10/09/14 12:59 |
| QC1203182738 358468005 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | 0.148 | | 1.05 | mg/L | | 90.2 | (90%-110%) | | 10/09/14 15:07 |
| Batch 1425371 | | | | | | | | | | | |
| QC1203182741 358468003 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | 0.266 | | 0.307 | mg/L | 14.3 ^ | | (+/-0.100) | KLP1 | 10/14/14 13:52 |
| QC1203182740 LCS | | | | | | | | | | | |

## QC Summary

**Workorder:** **358468**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | |
| Batch 1425371 | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | 1.06 | mg/L | | 106 | (90%-110%) | | 10/14/14 13:44 |
| QC1203182739 MB | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | U | ND | mg/L | | | | KLP1 | 10/14/14 13:43 |
| QC1203182742 358468003 MS | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | 0.266 | | 1.41 | mg/L | | 114* | (90%-110%) | | 10/14/14 13:53 |
| Batch 1425671 | | | | | | | | | | |
| QC1203183537 358468005 DUP | | | | | | | | | | |
| Phosphorus, Total as P | | 0.0712 | J | 0.0439 | mg/L | 47.4 ^ | | (+/-0.050) | KLP1 | 10/14/14 11:12 |
| QC1203183534 LCS | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | 1.00 | mg/L | | 100 | (83%-123%) | | 10/14/14 11:10 |
| QC1203183533 MB | | | | | | | | | | |
| Phosphorus, Total as P | | | J | 0.0343 | mg/L | | | | | 10/14/14 11:10 |
| QC1203183538 358468005 MS | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | 0.0712 | | 0.962 | mg/L | | 89.1 | (59%-141%) | | 10/14/14 11:17 |
| Batch 1425672 | | | | | | | | | | |
| QC1203183541 358468005 DUP | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 2.33 | | 2.28 | mg/L | 2.39 | | (0%-20%) | AXH3 | 10/22/14 09:53 |
| QC1203183540 LCS | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | 1.07 | mg/L | | 107 | (90%-110%) | | 10/22/14 09:43 |
| QC1203183539 MB | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | U | ND | mg/L | | | | | 10/22/14 09:42 |
| QC1203183543 358468005 PS | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | 0.466 | | 1.50 | mg/L | | 103 | (90%-110%) | | 10/22/14 09:58 |
| **Solids Analysis** | | | | | | | | | | |
| Batch 1425713 | | | | | | | | | | |
| QC1203183648 358468005 DUP | | | | | | | | | | |
| Total Dissolved Solids | | 214 | | 177 | mg/L | 19.0* | | (0%-10%) | MXB3 | 10/09/14 11:36 |
| QC1203183647 LCS | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | 293 | mg/L | | 97.6 | (95%-105%) | | 10/09/14 11:36 |
| QC1203183646 MB | | | | | | | | | | |
| Total Dissolved Solids | | | U | ND | mg/L | | | | | 10/09/14 11:36 |
| **Titration and Ion Analysis** | | | | | | | | | | |
| Batch 1426404 | | | | | | | | | | |

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## QC Summary

**Workorder:** **358468**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1426404 | | | | | | | | | | | |
| QC1203185287 358000013 DUP | | | | | | | | | | | |
| Conductivity | | | 283 | | 279 | umhos/cm | 1.43 | | (0%-10%) | PXO1 | 10/10/14 14:54 |
| QC1203185288 358468013 DUP | | | | | | | | | | | |
| Conductivity | | | 305 | | 304 | umhos/cm | 0.330 | | (0%-10%) | | 10/10/14 15:11 |
| QC1203185286 LCS | | | | | | | | | | | |
| Conductivity | 1410 | | | | 1420 | umhos/cm | | 100 | (95%-105%) | | 10/10/14 14:51 |
| Batch 1427923 | | | | | | | | | | | |
| QC1203189000 358008023 DUP | | | | | | | | | | | |
| pH | | H | 7.80 | H | 7.84 | SU | 0.457 | | (0%-5%) | PXO1 | 10/17/14 12:56 |
| QC1203188998 LCS | | | | | | | | | | | |
| pH | 7.00 | | | | 7.04 | SU | | 101 | (99%-101%) | | 10/17/14 12:47 |
| Batch 1427930 | | | | | | | | | | | |
| QC1203189015 358468005 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | 128 | | 128 | mg/L | 0.00 | | (0%-20%) | PXO1 | 10/16/14 17:29 |
| Carbonate alkalinity (CaCO3) | | U | ND | U | ND | mg/L | N/A | | | | |
| QC1203189010 LCS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | | 51.2 | mg/L | | 102 | (90%-110%) | | 10/16/14 17:09 |
| QC1203189008 MB | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | | U | ND | mg/L | | | | | 10/16/14 17:09 |
| Carbonate alkalinity (CaCO3) | | | | U | ND | mg/L | | | | | |
| QC1203189019 358468005 MS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | 128 | | 178 | mg/L | | 101 | (80%-120%) | | 10/16/14 17:36 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |

## QC Summary

**Workorder:** **358468**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 10-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 350.1, EPA 350.1 SC | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1425369 | See Below | | |

**Potentially affected work order(s)(SDG): 358468(2015-40)**

**Application Issues:**

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203182737DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 10-OCT-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 10-OCT-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 13-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| BALANCE | EPA 160.1, SM 2540C | Liquid | BRKL, ESHL, SCPO, WRPS |
| **Batch ID:** | **Sample Numbers:** | | |
| 1425713 | See Below | | |

**Potentially affected work order(s)(SDG): 358366,358404(35236),358429,358468(2015-40),358496**

**Application Issues:**

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203183648DUP,1203183649DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Morgan Buckner 13-OCT-14

**Data Validator/Group Leader:**

Elzbieta Szulc 27-OCT-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 14-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 351.2, EPA 351.2 SC | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1425371 | See Below | | |

**Potentially affected work order(s)(SDG): 358468(2015-40)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203182742MS | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference. |

**Originator's Name:**

Kristen Parson 14-OCT-14

**Data Validator/Group Leader:**

Elzbieta Szulc 15-OCT-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 17-OCT-14 | Industrial | Specifications | Process |
| **Instrument Type:** PC-Titrate TitraSip System | **Test / Method:** See Below | **Matrix Type:** Liquid | **Client Code:** BNKS, BRKL, CARE, ECOL, |
| **Batch ID:** 1427923 | **Sample Numbers:** See Below | | |

**Potentially affected work order(s)(SDG):** **358008(2015-20),358019,358429,358468(2015-40),358496,358711,358776(2015-59),358786,358871(35227),358956(V3993),358972(EUI-9779),358974(EUI-9781),359021**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| Test/Methods: EPA 150.1, SM 4500-H B, SW846 9040B/9040C, SW846 9040C<br><br>1. Sample received out of holding:<br><br>358008 023<br>358019 001<br>358429 001<br>358468 005,013,019,030<br>358496 001<br>358711 001,003<br>358776 001,002<br>358786 010<br>358871 001<br>358956 001<br>358972 001<br>358974 001<br>359021 001 | 1. Samples were received and analyzed outside of method specified holding time. |

**Originator's Name:**
Patrick Orgel 17-OCT-14

**Data Validator/Group Leader:**
Elzbieta Szulc 21-OCT-14

# Radiological Analysis

**Radiochemistry Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-40**
**Work Order 358468**

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Am241 Liquid** |
| Analytical Method: | DOE EML HASL-300, Am-05-RC Modified |
| Analytical Batch Number: | 1425702 |

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203183620 | MB for batch 1425702 |
| 1203183622 | Laboratory Control Sample (LCS) |
| 1203183621 | 358468019(CAWR-14-86874) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in October 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203183620 (MB) and 1203183622 (LCS) were changed to 1.0 per client request.

**Designated QC**

The following sample was used for QC: 358468019 (CAWR-14-86874). The QC was from ARSL work order 358468.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Pu, Liquid** |
| Analytical Method: | DOE EML HASL-300, Pu-11-RC Modified |
| Analytical Batch Number: | 1425703 |

| Sample ID | Client ID |
|---|---|

| | |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203183623 | MB for batch 1425703 |
| 1203183625 | Laboratory Control Sample (LCS) |
| 1203183624 | 358468019(CAWR-14-86874) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in October 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203183623 (MB) and 1203183625 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 358468019 (CAWR-14-86874). The QC was from ARSL work order 358468.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec U, Liquid** |
| Analytical Method: | DOE EML HASL-300, U-02-RC Modified |
| Analytical Batch Number: | 1425705 |

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203183626 | MB for batch 1425705 |
| 1203183628 | Laboratory Control Sample (LCS) |
| 1203183627 | 358468019(CAWR-14-86874) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using

mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in October 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203183626 (MB) and 1203183628 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 358468019 (CAWR-14-86874). The QC was from ARSL work order 358468.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population. Sample 358468012 (CAWR-14-86939) did not meet the client's yield requirement. However, there are 400 tracer counts, GEL's standard tracer yield requirements are met, and the client's detection limits are met.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Gammaspec** |
| Analytical Method: | EPA 901.1 |
| Analytical Batch Number: | 1425983 |

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203184292 | MB for batch 1425983 |
| 1203184294 | Laboratory Control Sample (LCS) |
| 1203184293 | 358468003(CAWR-14-86935) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2014, July 2014 and June 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
The blank volume is representative of the sample volume in this batch.

**Designated QC**
The following sample was used for QC: 358468003 (CAWR-14-86935). The QC was from ARSL work order 358468.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank 1203184292 (MB) result is greater than 1.65 times the combined standard uncertainty but less than the minimum detectable concentration for Na-22.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
Sample 1203184294 (LCS) was recounted due to high recovery. The recount is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
Additional comments were not required for this sample set.

**Blank Decision Level**
The blank 1203184292 (MB) result is greater than the critical level but less than the minimum detectable concentration for Na-22.

**Qualifier Information**

| Qualifier | Reason | Analyte | Sample | Client Sample |
|---|---|---|---|---|
| UI | Data rejected due to no valid peak. | Potassium-40 | 358468003 | CAWR-14-86935 |

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **GFPC, Sr90, liquid** |
| Analytical Method: | EPA 905.0 Modified |
| Analytical Batch Number: | 1427989 |

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203189174 | MB for batch 1427989 |
| 1203189177 | Laboratory Control Sample (LCS) |
| 1203189175 | 358468003(CAWR-14-86935) Sample Duplicate (DUP) |
| 1203189176 | 358468003(CAWR-14-86935) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in March 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203189174 (MB) and 1203189177 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 358468003 (CAWR-14-86935). The QC was from ARSL work order 358468.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**
Sample 358468019 (CAWR-14-86874) was recounted due to a suspected false positive. The recount is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike, 1203189176 (CAWR-14-86935), aliquot was reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **WSP-GrossA/B** |
| Analytical Method: | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1429454 |

| Sample ID | Client ID |
|---|---|
| 358468003 | CAWR-14-86935 |
| 358468012 | CAWR-14-86939 |
| 358468019 | CAWR-14-86874 |
| 358468029 | CAWR-14-86880 |
| 1203192663 | MB for batch 1429454 |
| 1203192667 | Laboratory Control Sample (LCS) |
| 1203192664 | 358776002(WST14-14-86623) Sample Duplicate (DUP) |
| 1203192665 | 358776002(WST14-14-86623) Matrix Spike (MS) |
| 1203192666 | 358776002(WST14-14-86623) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as

Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203192663 (MB) and 1203192667 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 358776002 (WST14-14-86623). The QC was from ARSL work order 358776.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Gross Alpha/Beta Preparation Information**
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

**Recounts**
Sample 1203192666 (WST14-14-86623) was recounted due to high recovery. The recount is reported. Sample 1203192664 (WST14-14-86623) was recounted due to high relative percent difference/relative error ratio. The recount is reported. Sample 358468019 (CAWR-14-86874) was recounted due to results more negative than the three sigma TPU. The second count is reported.

## Miscellaneous Information:

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike and matrix spike duplicate, 1203192665 (WST14-14-86623) and 1203192666 (WST14-14-86623), aliquots were reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

## Qualifier Information

Manual qualifiers were not required.

## Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-40  GEL Work Order: 358468

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

UI  Gamma Spectroscopy--Uncertain identification

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Heather M. McCarty  **Name: Heather McCarty**

**Date: 31 OCT 2014**  **Title: Analyst II**

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: October 31, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86935
Sample ID: 358468003
Matrix: W
Collect Date: 06-OCT-14
Receive Date: 08-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.00783 | +/-0.00691 | 0.0331 | 0.013 | +/-0.00691 | 0.050 | pCi/L | | HAKB | 10/16/14 | 1511 | 1425702 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00294 | +/-0.00657 | 0.0437 | 0.0179 | +/-0.00657 | 0.050 | pCi/L | | HAKB | 10/16/14 | 1511 | 1425703 | 2 |
| Plutonium-239/240 | U | -0.00294 | +/-0.00657 | 0.0386 | 0.0153 | +/-0.00657 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 6.84 | +/-0.131 | 0.0627 | 0.028 | +/-0.456 | 1.00 | pCi/L | | HAKB | 10/16/14 | 1306 | 1425705 | 3 |
| Uranium-235/236 | | 0.253 | +/-0.0282 | 0.0439 | 0.0178 | +/-0.0325 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 4.27 | +/-0.103 | 0.0334 | 0.0133 | +/-0.292 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | -1.32 | +/-1.66 | 5.72 | 2.54 | +/-1.69 | 8.00 | pCi/L | | MJH1 | 10/16/14 | 1118 | 1425983 | 4 |
| Cobalt-60 | U | -2.25 | +/-1.74 | 5.74 | 2.40 | +/-1.82 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | 1.82 | +/-3.28 | 11.8 | 5.45 | +/-3.31 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | UI | 32.8 | +/-21.4 | 32.1 | 11.3 | +/-21.4 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | -1.63 | +/-1.72 | 5.92 | 2.50 | +/-1.76 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | -0.205 | +/-0.129 | 0.487 | 0.227 | +/-0.129 | 0.500 | pCi/L | | KSD1 | 10/29/14 | 1410 | 1427989 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | | 5.35 | +/-0.710 | 1.86 | 0.868 | +/-0.856 | 3.00 | pCi/L | | JXH3 | 10/24/14 | 1311 | 1429454 | 6 |
| Alpha | | 10.4 | +/-1.71 | 2.81 | 1.04 | +/-1.92 | 3.00 | pCi/L | | JXH3 | 10/28/14 | 1739 | 1429454 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1425702 | 65.0 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1425703 | 68.7 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1425705 | 90.3 | (50%-105%) |

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## Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: October 31, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86935
Sample ID: 358468003

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1427989 | 87.6 | (50%-105%) |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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# Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: October 31, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86939
Sample ID: 358468012
Matrix: W
Collect Date: 06-OCT-14
Receive Date: 08-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.00497 | +/-0.00609 | 0.0315 | 0.0124 | +/-0.00609 | 0.050 | pCi/L | | HAKB | 10/16/14 | 1511 | 1425702 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00 | +/-0.0108 | 0.040 | 0.0164 | +/-0.0108 | 0.050 | pCi/L | | HAKB | 10/16/14 | 1511 | 1425703 | 2 |
| Plutonium-239/240 | U | -0.0215 | +/-0.017 | 0.0353 | 0.014 | +/-0.017 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 1.24 | +/-0.0754 | 0.113 | 0.0505 | +/-0.115 | 1.00 | pCi/L | | HAKB | 10/16/14 | 1306 | 1425705 | 3 |
| Uranium-235/236 | | 0.0945 | +/-0.0255 | 0.0792 | 0.0321 | +/-0.0263 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.809 | +/-0.0607 | 0.0603 | 0.0241 | +/-0.0829 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | 0.465 | +/-1.98 | 6.90 | 3.07 | +/-1.99 | 8.00 | pCi/L | | MJH1 | 10/16/14 | 1119 | 1425983 | 4 |
| Cobalt-60 | U | 0.0605 | +/-1.74 | 7.00 | 2.92 | +/-1.74 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | 3.31 | +/-2.79 | 10.9 | 5.00 | +/-2.89 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | -32.2 | +/-21.3 | 74.2 | 31.3 | +/-22.6 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | -1.67 | +/-1.82 | 6.59 | 2.73 | +/-1.86 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | -0.289 | +/-0.126 | 0.486 | 0.227 | +/-0.126 | 0.500 | pCi/L | | KSD1 | 10/29/14 | 1412 | 1427989 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | | 11.4 | +/-0.712 | 1.74 | 0.837 | +/-1.19 | 3.00 | pCi/L | | JXH3 | 10/24/14 | 2008 | 1429454 | 6 |
| Alpha | | 7.47 | +/-1.01 | 2.60 | 1.21 | +/-1.19 | 3.00 | pCi/L | | JXH3 | 10/28/14 | 1912 | 1429454 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1425702 | 70.9 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1425703 | 67.7 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1425705 | 49.9 * | (50%-105%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1427989 | 81.0 | (50%-105%) |

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## Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: October 31, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86939
Sample ID: 358468012

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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Los Alamos, New Mexico 87545

Report Date: October 31, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86874
Sample ID: 358468019
Matrix: W
Collect Date: 06-OCT-14
Receive Date: 08-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.00435 | +/-0.00615 | 0.0275 | 0.0108 | +/-0.00615 | 0.050 | pCi/L | | HAKB | 10/16/14 | 1511 | 1425702 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00271 | +/-0.00718 | 0.0403 | 0.0165 | +/-0.00718 | 0.050 | pCi/L | | HAKB | 10/16/14 | 1511 | 1425703 | 2 |
| Plutonium-239/240 | U | -0.00814 | +/-0.00718 | 0.0356 | 0.0141 | +/-0.00718 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | U | 0.00835 | +/-0.00835 | 0.0701 | 0.0313 | +/-0.00837 | 1.00 | pCi/L | | HAKB | 10/16/14 | 1306 | 1425705 | 3 |
| Uranium-235/236 | U | -0.00344 | +/-0.00769 | 0.0491 | 0.0199 | +/-0.0077 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | U | 0.0139 | +/-0.00835 | 0.0373 | 0.0149 | +/-0.0084 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | 2.18 | +/-1.43 | 5.50 | 2.52 | +/-1.52 | 8.00 | pCi/L | | MJH1 | 10/16/14 | 1136 | 1425983 | 4 |
| Cobalt-60 | U | 0.458 | +/-1.44 | 5.00 | 2.16 | +/-1.45 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | 0.792 | +/-2.77 | 9.63 | 4.50 | +/-2.77 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | 0.440 | +/-13.9 | 58.1 | 25.6 | +/-13.9 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | 0.0436 | +/-1.19 | 4.61 | 1.98 | +/-1.19 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | -0.121 | +/-0.128 | 0.482 | 0.221 | +/-0.128 | 0.500 | pCi/L | | KSD1 | 10/30/14 | 0956 | 1427989 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | U | -0.544 | +/-0.716 | 2.88 | 1.25 | +/-0.716 | 3.00 | pCi/L | | JXH3 | 10/28/14 | 1247 | 1429454 | 6 |
| Alpha | U | -1.12 | +/-0.504 | 2.73 | 1.09 | +/-0.504 | 3.00 | pCi/L | | JXH3 | 10/29/14 | 1101 | 1429454 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1425702 | 75.6 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1425703 | 64.4 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1425705 | 80.5 | (50%-105%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1427989 | 78.4 | (50%-105%) |

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Los Alamos, New Mexico 87545

Report Date: October 31, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86874
Sample ID: 358468019

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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# Certificate of Analysis

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Los Alamos, New Mexico 87545

Report Date: October 31, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86880
Sample ID: 358468029
Matrix: W
Collect Date: 06-OCT-14
Receive Date: 08-OCT-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | -0.00422 | +/-0.00517 | 0.0267 | 0.0105 | +/-0.00517 | 0.050 | pCi/L | | HAKB | 10/16/14 | 1511 | 1425702 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | -0.00588 | +/-0.00831 | 0.0437 | 0.0179 | +/-0.00832 | 0.050 | pCi/L | | HAKB | 10/16/14 | 1511 | 1425703 | 2 |
| Plutonium-239/240 | U | 0.00882 | +/-0.00882 | 0.0386 | 0.0153 | +/-0.00883 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 1.27 | +/-0.0567 | 0.0623 | 0.0278 | +/-0.0992 | 1.00 | pCi/L | | HAKB | 10/16/14 | 1306 | 1425705 | 3 |
| Uranium-235/236 | | 0.055 | +/-0.0137 | 0.0436 | 0.0177 | +/-0.0141 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.732 | +/-0.0429 | 0.0332 | 0.0132 | +/-0.0634 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | -1.11 | +/-1.45 | 5.11 | 2.26 | +/-1.47 | 8.00 | pCi/L | | MJH1 | 10/16/14 | 1136 | 1425983 | 4 |
| Cobalt-60 | U | 1.65 | +/-1.35 | 5.97 | 2.54 | +/-1.40 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | -3.84 | +/-3.02 | 9.96 | 4.58 | +/-3.15 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | 48.0 | +/-16.4 | 77.3 | 34.1 | +/-19.9 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | -0.704 | +/-1.58 | 5.88 | 2.51 | +/-1.59 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | 0.0751 | +/-0.138 | 0.479 | 0.222 | +/-0.138 | 0.500 | pCi/L | | KSD1 | 10/29/14 | 1410 | 1427989 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | | 10.1 | +/-0.764 | 2.02 | 0.975 | +/-1.17 | 3.00 | pCi/L | | JXH3 | 10/24/14 | 2008 | 1429454 | 6 |
| Alpha | | 5.86 | +/-1.04 | 2.92 | 1.36 | +/-1.16 | 3.00 | pCi/L | | JXH3 | 10/28/14 | 1912 | 1429454 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1425702 | 81.3 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1425703 | 68.0 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1425705 | 88.3 | (50%-105%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1427989 | 87.6 | (50%-105%) |

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## Certificate of Analysis

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Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: October 31, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-86880
Sample ID: 358468029

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# Quality Control Data

# GEL LABORATORIES LLC

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## QC Summary

**Report Date: October 31, 2014**


**Client :** **Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**

**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **358468**

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1425702 | | | | | | | | | | |
| QC1203183621 358468019 DUP | | | | | | | | | | |
| Americium-241 | U | 0.00435 | U | 0.00 | pCi/L | 0.166 | | (0-1) | HAKB | 10/16/1415:11 |
| | Uncert: | +/-0.00615 | | +/-0.00692 | | | | | | |
| | TPU: | +/-0.00615 | | +/-0.00692 | | | | | | |
| **Americium-243 Tracer | 2.67 | 2.02 | | 2.22 | pCi/L | | 82.9 | (50%-105%) | | |
| | Uncert: | +/-0.0761 | | +/-0.0763 | | | | | | |
| | TPU: | +/-0.132 | | +/-0.133 | | | | | | |
| QC1203183622 LCS | | | | | | | | | | |
| Americium-241 | 1.41 | | | 1.31 | pCi/L | | 92.8 | (80%-120%) | HAKB | 10/16/1415:11 |
| | Uncert: | | | +/-0.0492 | | | | | | |
| | TPU: | | | +/-0.0728 | | | | | | |
| **Americium-243 Tracer | 2.14 | | | 1.68 | pCi/L | | 78.6 | (50%-105%) | | |
| | Uncert: | | | +/-0.0625 | | | | | | |
| | TPU: | | | +/-0.108 | | | | | | |
| QC1203183620 MB | | | | | | | | | | |
| Americium-241 | | | U | 0.00786 | pCi/L | | | | HAKB | 10/16/1415:11 |
| | Uncert: | | | +/-0.00834 | | | | | | |
| | TPU: | | | +/-0.00834 | | | | | | |
| **Americium-243 Tracer | 2.14 | | | 1.63 | pCi/L | | 76.3 | (50%-105%) | | |
| | Uncert: | | | +/-0.0646 | | | | | | |
| | TPU: | | | +/-0.110 | | | | | | |
| Batch 1425703 | | | | | | | | | | |
| QC1203183624 358468019 DUP | | | | | | | | | | |
| Plutonium-238 | U | 0.00271 | U | 0.00471 | pCi/L | 0.0838 | | (0-1) | HAKB | 10/16/1415:11 |
| | Uncert: | +/-0.00718 | | +/-0.00471 | | | | | | |
| | TPU: | +/-0.00718 | | +/-0.00471 | | | | | | |
| Plutonium-239/240 | U | -0.00814 | U | 0.00706 | pCi/L | 0.567 | | (0-1) | | |
| | Uncert: | +/-0.00718 | | +/-0.00622 | | | | | | |
| | TPU: | +/-0.00718 | | +/-0.00623 | | | | | | |
| **Plutonium-242 Tracer | 2.46 | 1.58 | | 1.76 | pCi/L | | 71.4 | (50%-105%) | | |
| | Uncert: | +/-0.0825 | | +/-0.0763 | | | | | | |
| | TPU: | +/-0.135 | | +/-0.127 | | | | | | |
| QC1203183625 LCS | | | | | | | | | | |
| Plutonium-238 | | | U | 0.00354 | pCi/L | | | (80%-120%) | HAKB | 10/16/1415:11 |
| | Uncert: | | | +/-0.00501 | | | | | | |
| | TPU: | | | +/-0.00501 | | | | | | |
| Plutonium-239/240 | 1.97 | | | 1.86 | pCi/L | | 94.3 | (80%-120%) | | |
| | Uncert: | | | +/-0.0574 | | | | | | |
| | TPU: | | | +/-0.0951 | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.48 | pCi/L | | 75 | (50%-105%) | | |
| | Uncert: | | | +/-0.0593 | | | | | | |
| | TPU: | | | +/-0.0998 | | | | | | |

## QC Summary

**Workorder: 358468**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1425703 | | | | | | | | | | |
| QC1203183623 MB | | | | | | | | | | |
| Plutonium-238 | | | U | 0.00188 | pCi/L | | | | HAKB | 10/16/1415:11 |
| Uncert: | | | | +/-0.00325 | | | | | | |
| TPU: | | | | +/-0.00325 | | | | | | |
| Plutonium-239/240 | | | U | 0.00188 | pCi/L | | | | | |
| Uncert: | | | | +/-0.0042 | | | | | | |
| TPU: | | | | +/-0.0042 | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.44 | pCi/L | | 73.2 | (50%-105%) | | |
| Uncert: | | | | +/-0.0615 | | | | | | |
| TPU: | | | | +/-0.103 | | | | | | |
| Batch 1425705 | | | | | | | | | | |
| QC1203183627 358468019 DUP | | | | | | | | | | |
| Uranium-234 | U | 0.00835 | U | 0.0183 | pCi/L | 0.291 | | (0-1) | HAKB | 10/16/1413:06 |
| Uncert: | | +/-0.00835 | | +/-0.00869 | | | | | | |
| TPU: | | +/-0.00837 | | +/-0.00876 | | | | | | |
| Uranium-235/236 | U | -0.00344 | U | 0.00 | pCi/L | 0.091 | | (0-1) | | |
| Uncert: | | +/-0.00769 | | +/-0.0112 | | | | | | |
| TPU: | | +/-0.0077 | | +/-0.0112 | | | | | | |
| Uranium-238 | U | 0.0139 | U | 0.00786 | pCi/L | 0.198 | | (0-1) | | |
| Uncert: | | +/-0.00835 | | +/-0.00693 | | | | | | |
| TPU: | | +/-0.0084 | | +/-0.00695 | | | | | | |
| **Uranium-232 Tracer | 2.73 | 2.20 | | 2.26 | pCi/L | | 82.5 | (50%-105%) | | |
| Uncert: | | +/-0.0881 | | +/-0.0854 | | | | | | |
| TPU: | | +/-0.198 | | +/-0.195 | | | | | | |
| QC1203183628 LCS | | | | | | | | | | |
| Uranium-234 | | | | 2.72 | pCi/L | | | | HAKB | 10/16/1413:06 |
| Uncert: | | | | +/-0.079 | | | | | | |
| TPU: | | | | +/-0.194 | | | | | | |
| Uranium-235/236 | | | | 0.142 | pCi/L | | | | | |
| Uncert: | | | | +/-0.0203 | | | | | | |
| TPU: | | | | +/-0.0223 | | | | | | |
| Uranium-238 | 2.72 | | | 2.74 | pCi/L | | 101 | (80%-120%) | | |
| Uncert: | | | | +/-0.079 | | | | | | |
| TPU: | | | | +/-0.195 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.77 | pCi/L | | 81.1 | (50%-105%) | | |
| Uncert: | | | | +/-0.0711 | | | | | | |
| TPU: | | | | +/-0.159 | | | | | | |
| QC1203183626 MB | | | | | | | | | | |
| Uranium-234 | | | U | 0.00618 | pCi/L | | | | HAKB | 10/16/1413:06 |
| Uncert: | | | | +/-0.00743 | | | | | | |
| TPU: | | | | +/-0.00744 | | | | | | |
| Uranium-235/236 | | | U | 0.00509 | pCi/L | | | | | |
| Uncert: | | | | +/-0.0072 | | | | | | |
| TPU: | | | | +/-0.00721 | | | | | | |
| Uranium-238 | | | U | 0.00 | pCi/L | | | | | |
| Uncert: | | | | +/-0.00412 | | | | | | |
| TPU: | | | | +/-0.00412 | | | | | | |

## QC Summary

**Workorder:** **358468**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1425705 | | | | | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.91 | pCi/L | | 87.2 | (50%-105%) | | |
| | Uncert: | | | +/-0.0674 | | | | | | |
| | TPU: | | | +/-0.156 | | | | | | |
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1425983 | | | | | | | | | | |
| QC1203184293 358468003 DUP | | | | | | | | | | |
| Cesium-137 | U | -1.32 | U | -1.91 | pCi/L | 0.0963 | | (0-1) | MJH1 | 10/17/1410:13 |
| | Uncert: | +/-1.66 | | +/-1.30 | | | | | | |
| | TPU: | +/-1.69 | | +/-1.38 | | | | | | |
| Cobalt-60 | U | -2.25 | U | -1.03 | pCi/L | 0.192 | | (0-1) | | |
| | Uncert: | +/-1.74 | | +/-1.32 | | | | | | |
| | TPU: | +/-1.82 | | +/-1.35 | | | | | | |
| Neptunium-237 | U | 1.82 | U | -0.902 | pCi/L | 0.227 | | (0-1) | | |
| | Uncert: | +/-3.28 | | +/-2.69 | | | | | | |
| | TPU: | +/-3.31 | | +/-2.70 | | | | | | |
| Potassium-40 | UI | 32.8 | U | 15.4 | pCi/L | 0.209 | | (0-1) | | |
| | Uncert: | +/-21.4 | | +/-20.3 | | | | | | |
| | TPU: | +/-21.4 | | +/-20.3 | | | | | | |
| Sodium-22 | U | -1.63 | U | 0.460 | pCi/L | 0.360 | | (0-1) | | |
| | Uncert: | +/-1.72 | | +/-1.14 | | | | | | |
| | TPU: | +/-1.76 | | +/-1.14 | | | | | | |
| QC1203184294 LCS | | | | | | | | | | |
| Americium-241 | 34500 | | | 37600 | pCi/L | | 109 | (80%-120%) | MJH1 | 10/20/1411:15 |
| | Uncert: | | | +/-472 | | | | | | |
| | TPU: | | | +/-1400 | | | | | | |
| Cesium-137 | 14000 | | | 14600 | pCi/L | | 105 | (80%-120%) | | |
| | Uncert: | | | +/-165 | | | | | | |
| | TPU: | | | +/-625 | | | | | | |
| Cobalt-60 | 16900 | | | 17400 | pCi/L | | 103 | (80%-120%) | | |
| | Uncert: | | | +/-196 | | | | | | |
| | TPU: | | | +/-741 | | | | | | |
| Neptunium-237 | | | U | -20.7 | pCi/L | | | | | |
| | Uncert: | | | +/-69.5 | | | | | | |
| | TPU: | | | +/-69.7 | | | | | | |
| Potassium-40 | | | U | 40.6 | pCi/L | | | | | |
| | Uncert: | | | +/-141 | | | | | | |
| | TPU: | | | +/-141 | | | | | | |
| Sodium-22 | | | U | 32.7 | pCi/L | | | | | |
| | Uncert: | | | +/-25.5 | | | | | | |
| | TPU: | | | +/-26.6 | | | | | | |
| QC1203184292 MB | | | | | | | | | | |
| Cesium-137 | | | U | -1.33 | pCi/L | | | | MJH1 | 10/16/1411:38 |
| | Uncert: | | | +/-1.62 | | | | | | |
| | TPU: | | | +/-1.65 | | | | | | |
| Cobalt-60 | | | U | 0.942 | pCi/L | | | | | |
| | Uncert: | | | +/-1.76 | | | | | | |

## QC Summary

**Workorder:** **358468**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1425983 | | | | | | | | | | |
| | TPU: | | | +/-1.77 | | | | | | |
| Neptunium-237 | | | U | 4.19 | pCi/L | | | | | |
| | Uncert: | | | +/-3.42 | | | | | | |
| | TPU: | | | +/-3.56 | | | | | | |
| Potassium-40 | | | U | -11.6 | pCi/L | | | | | |
| | Uncert: | | | +/-19.9 | | | | | | |
| | TPU: | | | +/-20.1 | | | | | | |
| Sodium-22 | | | U | 3.61 | pCi/L | | | | | |
| | Uncert: | | | +/-1.42 | | | | | | |
| | TPU: | | | +/-1.65 | | | | | | |
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1427989 | | | | | | | | | | |
| QC1203189175 358468003 DUP | | | | | | | | | | |
| Strontium-90 | U | -0.205 | U | -0.226 | pCi/L | 0.0407 | | (0-1) | KSD1 | 10/29/1414:11 |
| | Uncert: | +/-0.129 | | +/-0.128 | | | | | | |
| | TPU: | +/-0.129 | | +/-0.128 | | | | | | |
| **Strontium Carrier | 7.65 | 6.70 | | 6.80 | mg | | 88.9 | (50%-105%) | | |
| QC1203189177 LCS | | | | | | | | | | |
| Strontium-90 | 23.9 | | | 23.9 | pCi/L | | 100 | (80%-120%) | KSD1 | 10/29/1413:18 |
| | Uncert: | | | +/-0.716 | | | | | | |
| | TPU: | | | +/-2.07 | | | | | | |
| **Strontium Carrier | 7.65 | | | 6.80 | mg | | 88.9 | (50%-105%) | | |
| QC1203189174 MB | | | | | | | | | | |
| Strontium-90 | | | U | 0.0451 | pCi/L | | | | KSD1 | 10/29/1414:11 |
| | Uncert: | | | +/-0.0846 | | | | | | |
| | TPU: | | | +/-0.0846 | | | | | | |
| **Strontium Carrier | 7.65 | | | 7.20 | mg | | 94.1 | (50%-105%) | | |
| QC1203189176 358468003 MS | | | | | | | | | | |
| Strontium-90 | 239 U | -0.205 | | 263 | pCi/L | | 110 | (75%-125%) | KSD1 | 10/29/1413:18 |
| | Uncert: | +/-0.129 | | +/-7.63 | | | | | | |
| | TPU: | +/-0.129 | | +/-22.5 | | | | | | |
| **Strontium Carrier | 7.65 | 6.70 | | 6.90 | mg | | 90.2 | (50%-105%) | | |
| Batch 1429454 | | | | | | | | | | |
| QC1203192664 358776002 DUP | | | | | | | | | | |
| Alpha | | 3.11 | | 5.01 | pCi/L | 0.394 | | (0-1) | JXH3 | 10/29/1411:03 |
| | Uncert: | +/-1.07 | | +/-1.24 | | | | | | |
| | TPU: | +/-1.10 | | +/-1.31 | | | | | | |
| Beta | | 18.4 | | 17.0 | pCi/L | 0.196 | | (0-1) | | 10/24/1420:11 |
| | Uncert: | +/-0.821 | | +/-1.17 | | | | | | |
| | TPU: | +/-1.75 | | +/-1.84 | | | | | | |
| QC1203192667 LCS | | | | | | | | | | |
| Alpha | 12.2 | | | 12.4 | pCi/L | | 102 | (80%-120%) | JXH3 | 10/28/1417:38 |
| | Uncert: | | | +/-0.618 | | | | | | |
| | TPU: | | | +/-1.25 | | | | | | |
| Beta | 47.8 | | | 54.8 | pCi/L | | 115 | (80%-120%) | | 10/24/1413:14 |

## QC Summary

**Workorder:** **358468**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1429454 | | | | | | | | | | |
| | Uncert: | | | +/-0.960 | | | | | | |
| | TPU: | | | +/-4.71 | | | | | | |
| QC1203192663 MB | | | | | | | | | | |
| Alpha | | | U | -0.00914 | pCi/L | | | | JXH3 | 10/28/1417:39 |
| | Uncert: | | | +/-0.0826 | | | | | | |
| | TPU: | | | +/-0.0826 | | | | | | |
| Beta | | | U | 0.101 | pCi/L | | | | | 10/24/1412:49 |
| | Uncert: | | | +/-0.107 | | | | | | |
| | TPU: | | | +/-0.108 | | | | | | |
| QC1203192665 358776002 MS | | | | | | | | | | |
| Alpha | 608 | 3.11 | | 592 | pCi/L | | 96.8 | (75%-125%) | JXH3 | 10/28/1417:38 |
| | Uncert: | +/-1.07 | | +/-34.0 | | | | | | |
| | TPU: | +/-1.10 | | +/-62.1 | | | | | | |
| Beta | 2390 | 18.4 | | 2870 | pCi/L | | 119 | (75%-125%) | | 10/24/1413:10 |
| | Uncert: | +/-0.821 | | +/-49.8 | | | | | | |
| | TPU: | +/-1.75 | | +/-243 | | | | | | |
| QC1203192666 358776002 MSD | | | | | | | | | | |
| Alpha | 608 | 3.11 | | 518 | pCi/L | 0.310 | 84.7 | (0-1) | JXH3 | 10/28/1417:38 |
| | Uncert: | +/-1.07 | | +/-32.8 | | | | | | |
| | TPU: | +/-1.10 | | +/-56.3 | | | | | | |
| Beta | 2390 | 18.4 | | 2870 | pCi/L | 0.00254 | 119 | (0-1) | | 10/28/1411:27 |
| | Uncert: | +/-0.821 | | +/-50.0 | | | | | | |
| | TPU: | +/-1.75 | | +/-244 | | | | | | |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

| | |
|---|---|
| ** | Analyte is a Tracer compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| BD | Results are either below the MDC or tracer recovery is low |
| FA | Failed analysis. |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| K | Analyte present. Reported value may be biased high. Actual value is expected to be lower. |
| L | Analyte present. Reported value may be biased low. Actual value is expected to be higher. |
| M | M if above MDC and less than LLD |
| M | REMP Result > MDC/CL and < RDL |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |

## QC Summary

**Workorder:** **358468**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| UI | Gamma Spectroscopy--Uncertain identification |
| UJ | Gamma Spectroscopy--Uncertain identification |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | Other specific qualifiers were required to properly define the results. Consult case narrative. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
** Indicates analyte is a surrogate/tracer compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Cape Fear Analytical
3306 Kitty Hawk Road, Suite 120
Wilmington NC 28405

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-43



Client Contact:

Lab Agreement # : 63641-001-10

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-8290-D/F |
|---|---|---|---|---|
| CAWR-14-86939 | Oct 6 2014 | 10:55 | W | 2 |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 2 |
| CAWR-14-86875 | Oct 6 2014 | 10:55 | W | 2 |
| CAWR-14-86880 | Oct 6 2014 | 10:55 | W | 2 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Marty | 10/7/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1235 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | PEB | |
| TOP DEPTH: | | | SAMPLE USAGE: | QC | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | ~~WSP-8011-TB~~ | ~~40 ML SEPTUM GLASS~~ | ~~1~~ | ~~HCL~~ DF 10/6/14 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | 1 | ICE AT 8/3/14 | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 1 | ICE AT 8/3/14 | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS | 1 | ICE AT 8/3/14 | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 1 | ICE AT 8/3/14 | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS | 1 | ICE AT 8/3/14 | | |
| | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-CN(T) | 250 ML POLY | 1 | NAOH | Y | NA |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 1 | ICE AT 8/3/14 | | |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | ~~WSP-LL-8260B-TB~~ | ~~40 ML SEPTUM GLASS~~ | ~~1~~ | ~~ICE~~ OF 10/6/14 | | |
| NA | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | Y | NA |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | Y | NA |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Shaw

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86875

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/08/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FB | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | QC | ↓ |
| BOTTOM DEPTH: | | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | Y | NA |
| ↓ | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~6~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8290-D/F | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8310-PAH | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86875

**WORK ORDER:**

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Stokes + A. Stocke

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** Andrew Stocke | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** M. Martin | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86880

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FD | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | QC | ↓ |
| BOTTOM DEPTH: | | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| ↓ | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ↓ | ↓ |
| ↓ | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | ~~3~~ ~~2~~ ~~1~~ | HCL DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8290-D/F | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8310-PAH | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | ↓ | ↓ |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86880

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:** JS 10/6/14

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Stew

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stocker | 10/6/14 1305 | | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86939

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | WS | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | RC |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | WCS | | FIELD QC TYPE: | REG | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | INV | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| ↓ | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ↓ | ↓ |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | 3 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86939 **WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.75 mg/L Flow (in gpm) 291,740 GPM Oxidation-Reduction Potential NA mV

pH 8.27 SU Specific Conductance 325 uS/cm Temperature 13.80 deg C

Turbidity 79.8 NTU

**COLLECTED BY (PRINT)** W. Stan

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stocke | 10/6/14 1305 | M. Martin | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-43

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 6730 | SW-846:8290A | 1 | 1 | | 1 | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6730 | SW-846:8290A | 27263 | 27260 | 1 | 1 | | 1 | | 1 | | | | | 1 | 1 | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8290A | DIOXINS FURANS | CAWR-14-86874 | 6730002 | PEB | 25 | 9 | 0 | 0 |
| SW-846:8290A | DIOXINS FURANS | CAWR-14-86875 | 6730003 | FB | 25 | 9 | 0 | 0 |
| SW-846:8290A | DIOXINS FURANS | CAWR-14-86880 | 6730004 | FD | 25 | 9 | 0 | 0 |
| SW-846:8290A | DIOXINS FURANS | CAWR-14-86939 | 6730001 | REG | 25 | 9 | 0 | 0 |
| SW-846:8290A | DIOXINS FURANS | LCS | 12011715 | LCS | 0 | 9 | 17 | 0 |
| SW-846:8290A | DIOXINS FURANS | LCSD | 12011716 | LCSD | 0 | 9 | 17 | 0 |
| SW-846:8290A | DIOXINS FURANS | MB | 12011714 | MB | 25 | 9 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

| Reason Code | Description |
|---|---|

# DATA VALIDATION REPORT

| Reason Code | Description |
|---|---|
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8290A | 0 | 25 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8290A | 0 | 25 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8290A | 0 | 25 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8290A | 0 | 25 |

CFA | Cape Fear Analytical LLC
an affiliate of The GEL Group INC

3306 Kitty Hawk Road, Suite 120 Wilmington, NC 28405
P 910.795.0421
www.capefearanalytical.com

November 05, 2014

Mr. Keith Greene
Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: 2012 WQH with LOCUS EDD
Work Order: 6730
SDG: 2015-43

Dear Mr. Greene:

Cape Fear Analytical LLC (CFA) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 08, 2014. This original data report has been prepared and reviewed in accordance with CFAôs standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at 910-795-0421.

Sincerely,

Cynde Larkins

Cynthia Larkins
Project Manager

Chain of Custody: 2015-43
Enclosures



problem solved

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**Los Alamos National Laboratory**
**2012 WQH with LOCUS EDD**
**Workorder #: 6730**
**SDG # : 2015-43**

# Case Narrative

**Receipt Narrative**
**for**
**Los Alamos National Laboratory**
**SDG: 2015-43**
**Work Order: 6730**

**Laboratory Identification**
Cape Fear Analytical, LLC
3306 Kitty Hawk Road, Suite 120
Wilmington, North Carolina 28405
(910) 795-0421

**Summary**
**Sample receipt:** The samples arrived at Cape Fear Analytical LLC (CFA), Wilmington, North Carolina on October 08, 2014 for analysis. The samples were delivered with proper chain of custody documentation and signatures. Shipping container temperatures were checked, documented, and within specifications. All sample containers arrived without any visible signs of tampering or breakage. Appropriate sample containers were received. Sample containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Sufficient sample was received for analysis. There are no additional comments concerning sample receipt.

**Sample Identification:** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 6730001 | CAWR-14-86939 |
| 6730002 | CAWR-14-86874 |
| 6730003 | CAWR-14-86875 |
| 6730004 | CAWR-14-86880 |

**Case Narrative**
Sample analyses were conducted using methodology as outlined in Cape Fear Analyticalôs Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**
The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist and data from the following fractions: High Resolution Dioxins and Furans.

Sincerely,

Cynde Larkins

Cynthia Larkins
Project Manager

**List of current CFA Certifications as of 09 October 2014**

| State | Certification |
|---|---|
| California (NELAC) | 09270CA |
| New Jersey (NELAC) | NC013 |
| North Carolina | NC01894 |
| South Carolina | 99063001 |
| Utah (Primary NELAC) | CFAL |

# Chain of Custody and Supporting Documentation

WO # 6730

Cape Fear Analytical
3306 Kitty Hawk Road, Suite 120
Wilmington NC 28405

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-43

Page 1 of 1

Client Contact:

Lab Agreement # : 63641-001-10
Project Number :
Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

1 Cont. received

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-8290-D/F |
|---|---|---|---|---|
| CAWR-14-86939 | Oct 6 2014 | 10:55 | W | 2 |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 2 |
| CAWR-14-86875 | Oct 6 2014 | 10:55 | W | 2 |
| CAWR-14-86880 | Oct 6 2014 | 10:55 | W | 2 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | Melissa Martz | 10/7/14 3:00 | Cynde Larkins | CYNDE LARKINS | 08OCT14 1030 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

temp. = 4.2 °C

# SAMPLE RECEIPT CHECKLIST

*Cape Fear Analytical*

| | | | |
|---|---|---|---|
| Client: | LANL | Work Order: | 6730 |
| Shipping Company: | FedEx | Date/Time Received: | 08OCT14 1030 |

| Suspected Hazard Information | Yes | NA | No |
|---|---|---|---|
| Shipped as DOT Hazardous? | | | ✓ |
| Samples identified as Foreign Soil? | | | ✓ |

| DOE Site Sample Packages | Yes | NA | No* |
|---|---|---|---|
| Screened <0.5 mR/hr? | ✓ | | |
| Samples < 2x background? | ✓ | | |

* Notify RSO of any responses in this column immediately.

| Air Sample Receipt Specifics | Yes | NA | No |
|---|---|---|---|
| Air sample in shipment? | | | ✓ |

Air Witness: _____

| | Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (required for Non-Conforming Items) |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | ✓ | | | Circle Applicable: seals broken damaged container leaking container other(describe) |
| 2 | Chain of Custody documents included with shipment? | ✓ | | | |
| 3 | Samples requiring cold preservation within 0-6°C? | ✓ | | | Preservation Method: ice bags blue ice dry ice none other (describe) 4.2°C |
| 4 | Aqueous samples found to have visible solids? | | | ✓ | Sample IDs, containers affected: |
| 5 | Samples requiring chemical preservation at proper pH? | | ✓ | | Sample IDs, containers affected and pH observed: pH=7 on all containers If preservative added, Lot#: |
| 6 | Samples requiring preservation have no residual chlorine? | ✓ | | | Sample IDs, containers affected: If preservative added, Lot#: |
| 7 | Samples received within holding time? | ✓ | | | Sample IDs, tests affected: |
| 8 | Sample IDs on COC match IDs on containers? | ✓ | | | Sample IDs, containers affected: |
| 9 | Date & time of COC match date & time on containers? | ✓ | | | Sample IDs, containers affected: |
| 10 | Number of containers received match number indicated on COC? | | | ✓ | Sample IDs, containers affected: |
| 11 | COC form is properly signed in relinquished/received sections? | ✓ | | | |

Comments:

1 container received (COC has 2 listed) CAWR-14-86874, 86875 and 86880.

Checklist performed by: Initials: CL Date: 08OCT14

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07OCT14
ACTWGT: 35.0 LB MAN
CAD: 0014176/CAFE2805

BILL SENDER

TO CHRIS CORNWELL
CAPE FEAR ANALYTICAL
3306 KITTY HAWK ROAD, SUITE 120

WILMINGTON NC 28405
(910) 795-0421
REF: WE991158[illegible]100

FedEx Express

TRK# 5908 1777 8808

WED - 08 OCT 10:30A
PRIORITY OVERNIGHT

XH ILMA

28405
NC-US GSO

Part # 156149-434 RIT2 10/11

temp. = 4.2°C

WO#6730

# High Resolution Dioxins and Furans Analysis

# Case Narrative

**HDOX LANL Case Narrative**
**Los Alamos National Laboratory (LANL)**
**SDG 2015-43**
**Work Order 6730**

## Method/Analysis Information

| | |
|---|---|
| **Product:** | **Dioxins/Furans by SW846 Method 8290A in Liquids** |
| Analytical Method: | SW846 8290A |
| Extraction Method: | SW846 3520C |
| Analytical Batch Number: | 27263 |
| Clean Up Batch Number: | 27261 |
| Extraction Batch Number: | 27260 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8290A:

| Sample ID | Client ID |
|---|---|
| 6730001 | CAWR-14-86939 |
| 6730002 | CAWR-14-86874 |
| 6730003 | CAWR-14-86875 |
| 6730004 | CAWR-14-86880 |
| 12011714 | Method Blank (MB) |
| 12011715 | Laboratory Control Sample (LCS) |
| 12011716 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

### SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by Cape Fear Analytical LLC (CFA) as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with CF-OA-E-002 REV# 13.

Raw data reports are processed and reviewed by the analyst using the TargetLynx software package.

## Calibration Information

### Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

## Quality Control (QC) Information

**Certification Statement**
The test results presented in this document are certified to meet all requirements of the 2003 NELAC Standard.

**Method Blank (MB) Statement**
The MB(s) analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD(s) between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
A matrix spike and matrix spike duplicate analysis was not required for this SDG.

## Technical Information

**Holding Time Specifications**
CFA assigns holding times based on the associated methodology, which assigns the date and time from sample collection. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG.

## Miscellaneous Information

**Nonconformance (NCR) Documentation**
A NCR was not required for this SDG.

**Manual Integrations**
Certain standards and QC samples required manual integrations to correctly position the baseline as set in the calibration standard injections. Where manual integrations were performed, copies of all manual integration peak profiles are included in the raw data section of this fraction. Manual integrations were required for data files in this SDG.

**System Configuration**
This analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| HRP763_1 | High-Resolution GC/MS System | Dioxin Analysis | DB-5MS | 60m x 0.25mm, 0.25um |

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

# Sample Data Summary

# Cape Fear Analytical, LLC

3306 Kitty Hawk Road Suite 120, Wilmington, NC 28405 - (910) 795-0421 - www.capefearanalytical.com

## Qualifier Definition Report
## for

LANL001 Los Alamos National Laboratory

Client SDG: 2015-43 CFA Work Order: 6730

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

K Estimated Maximum Possible Concentration

U Analyte was analyzed for , but not detected above the specified detection limit.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

Cape Fear Analytical requires all analytical data to be verified by a qualified data reviewer.

The following data validator verified the information presented in this case narrative:

**Signature:** Heather Patterson **Name: Heather Patterson**

**Date: 05 NOV 2014** **Title: Data Validator**

# Hi-Res Dioxins/Furans
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-43** | **Client:** | **LANL001** | **Project:** | **LANL00112** |
| **Lab Sample ID:** | **6730001** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **WATER** |
| **Client Sample:** | **8290 Water** | **Date Received:** | **10/08/2014 10:30** | | |
| **Client ID:** | **CAWR-14-86939** | | | **Prep Basis:** | **As Received** |
| **Batch ID:** | **27263** | **Method:** | **SW846 8290A** | | |
| **Run Date:** | **10/29/2014 14:21** | **Analyst:** | **CLP** | **Instrument:** | **HRP763** |
| **Data File:** | **b29oct14b-5** | | | **Dilution:** | **1** |
| **Prep Batch:** | **27260** | **Prep Method:** | **SW846 3520C** | | |
| **Prep Date:** | **16-OCT-14** | **Prep Aliquot:** | **923.5 mL** | | |

| CAS No. | Parmname | Qual | Result | EMPC | Units | EDL | PQL |
|---|---|---|---|---|---|---|---|
| 1746-01-6 | 2,3,7,8-TCDD | U | 4.31 | | pg/L | 4.31 | 10.8 |
| 40321-76-4 | 1,2,3,7,8-PeCDD | U | 7.84 | | pg/L | 7.84 | 54.1 |
| 39227-28-6 | 1,2,3,4,7,8-HxCDD | U | 18.4 | | pg/L | 18.4 | 54.1 |
| 57653-85-7 | 1,2,3,6,7,8-HxCDD | U | 16.2 | | pg/L | 16.2 | 54.1 |
| 19408-74-3 | 1,2,3,7,8,9-HxCDD | U | 19.2 | | pg/L | 19.2 | 54.1 |
| 35822-46-9 | 1,2,3,4,6,7,8-HpCDD | U | 18.6 | | pg/L | 18.6 | 54.1 |
| 3268-87-9 | 1,2,3,4,6,7,8,9-OCDD | U | 19.5 | | pg/L | 19.5 | 108 |
| 51207-31-9 | 2,3,7,8-TCDF | U | 3.96 | | pg/L | 3.96 | 10.8 |
| 57117-41-6 | 1,2,3,7,8-PeCDF | U | 5.41 | | pg/L | 5.41 | 54.1 |
| 57117-31-4 | 2,3,4,7,8-PeCDF | U | 5.41 | | pg/L | 5.41 | 54.1 |
| 70648-26-9 | 1,2,3,4,7,8-HxCDF | U | 8.4 | | pg/L | 8.40 | 54.1 |
| 57117-44-9 | 1,2,3,6,7,8-HxCDF | U | 7.1 | | pg/L | 7.10 | 54.1 |
| 60851-34-5 | 2,3,4,6,7,8-HxCDF | U | 7.82 | | pg/L | 7.82 | 54.1 |
| 72918-21-9 | 1,2,3,7,8,9-HxCDF | U | 10.9 | | pg/L | 10.9 | 54.1 |
| 67562-39-4 | 1,2,3,4,6,7,8-HpCDF | U | 8.51 | | pg/L | 8.51 | 54.1 |
| 55673-89-7 | 1,2,3,4,7,8,9-HpCDF | U | 13.1 | | pg/L | 13.1 | 54.1 |
| 39001-02-0 | 1,2,3,4,6,7,8,9-OCDF | U | 23.6 | | pg/L | 23.6 | 108 |
| 41903-57-5 | Total TCDDs | U | 4.31 | | pg/L | 4.31 | 10.8 |
| 36088-22-9 | Total PeCDDs | U | 7.84 | | pg/L | 7.84 | 54.1 |
| 34465-46-8 | Total HxCDDs | U | 18.4 | | pg/L | 18.4 | 54.1 |
| 37871-00-4 | Total HpCDDs | U | 18.6 | | pg/L | 18.6 | 54.1 |
| 30402-14-3 | Total TCDFs | U | 3.96 | | pg/L | 3.96 | 10.8 |
| 30402-15-4 | Total PeCDFs | U | 5.41 | | pg/L | 5.41 | 54.1 |
| 55684-94-1 | Total HxCDFs | U | 7.1 | | pg/L | 7.10 | 54.1 |
| 38998-75-3 | Total HpCDFs | U | 13.1 | | pg/L | 13.1 | 54.1 |
| 3333-30-0 | TEQ WHO2005 ND=0 | | 0.00 | 0.00 | pg/L | | |
| 3333-30-1 | TEQ WHO2005 ND=0.5 | | 11.8 | 11.8 | pg/L | | |

| Surrogate/Tracer recovery | Qual | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | | 1750 | 2170 | pg/L | 80.8 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDD | | 2170 | 2170 | pg/L | 100 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDD | | 1630 | 2170 | pg/L | 75.2 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDD | | 1950 | 2170 | pg/L | 90.1 | (40%-135%) |
| 13C-OCDD | | 3380 | 4330 | pg/L | 78.1 | (40%-135%) |
| 13C-2,3,7,8-TCDF | | 1880 | 2170 | pg/L | 86.6 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDF | | 1990 | 2170 | pg/L | 91.8 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDF | | 1560 | 2170 | pg/L | 72.2 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDF | | 1650 | 2170 | pg/L | 76.0 | (40%-135%) |

**Comments:**

**U Analyte was analyzed for , but not detected above the specified detection limit.**

# Hi-Res Dioxins/Furans
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-43** | **Client:** | **LANL001** | **Project:** | **LANL00112** |
| **Lab Sample ID:** | **6730002** | **Date Collected:** | **10/06/2014 12:35** | **Matrix:** | **WATER** |
| **Client Sample:** | **8290 Water** | **Date Received:** | **10/08/2014 10:30** | | |
| **Client ID:** | **CAWR-14-86874** | | | **Prep Basis:** | **As Received** |
| **Batch ID:** | **27263** | **Method:** | **SW846 8290A** | | |
| **Run Date:** | **10/29/2014 15:09** | **Analyst:** | **CLP** | **Instrument:** | **HRP763** |
| **Data File:** | **b29oct14b-6** | | | **Dilution:** | **1** |
| **Prep Batch:** | **27260** | **Prep Method:** | **SW846 3520C** | | |
| **Prep Date:** | **16-OCT-14** | **Prep Aliquot:** | **919.4 mL** | | |

| CAS No. | Parmname | Qual | Result | EMPC | Units | EDL | PQL |
|---|---|---|---|---|---|---|---|
| 1746-01-6 | 2,3,7,8-TCDD | U | 1.36 | | pg/L | 1.36 | 10.9 |
| 40321-76-4 | 1,2,3,7,8-PeCDD | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 39227-28-6 | 1,2,3,4,7,8-HxCDD | U | 8.38 | | pg/L | 8.38 | 54.4 |
| 57653-85-7 | 1,2,3,6,7,8-HxCDD | U | 7.37 | | pg/L | 7.37 | 54.4 |
| 19408-74-3 | 1,2,3,7,8,9-HxCDD | U | 8.7 | | pg/L | 8.70 | 54.4 |
| 35822-46-9 | 1,2,3,4,6,7,8-HpCDD | U | 8.2 | | pg/L | 8.20 | 54.4 |
| 3268-87-9 | 1,2,3,4,6,7,8,9-OCDD | U | 10.9 | | pg/L | 10.9 | 109 |
| 51207-31-9 | 2,3,7,8-TCDF | U | 1.48 | | pg/L | 1.48 | 10.9 |
| 57117-41-6 | 1,2,3,7,8-PeCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 57117-31-4 | 2,3,4,7,8-PeCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 70648-26-9 | 1,2,3,4,7,8-HxCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 57117-44-9 | 1,2,3,6,7,8-HxCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 60851-34-5 | 2,3,4,6,7,8-HxCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 72918-21-9 | 1,2,3,7,8,9-HxCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 67562-39-4 | 1,2,3,4,6,7,8-HpCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 55673-89-7 | 1,2,3,4,7,8,9-HpCDF | U | 5.57 | | pg/L | 5.57 | 54.4 |
| 39001-02-0 | 1,2,3,4,6,7,8,9-OCDF | U | 10.9 | | pg/L | 10.9 | 109 |
| 41903-57-5 | Total TCDDs | U | 1.36 | | pg/L | 1.36 | 10.9 |
| 36088-22-9 | Total PeCDDs | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 34465-46-8 | Total HxCDDs | U | 8.11 | | pg/L | 8.11 | 54.4 |
| 37871-00-4 | Total HpCDDs | U | 8.2 | | pg/L | 8.20 | 54.4 |
| 30402-14-3 | Total TCDFs | U | 1.48 | | pg/L | 1.48 | 10.9 |
| 30402-15-4 | Total PeCDFs | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 55684-94-1 | Total HxCDFs | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 38998-75-3 | Total HpCDFs | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 3333-30-0 | TEQ WHO2005 ND=0 | | 0.00 | 0.00 | pg/L | | |
| 3333-30-1 | TEQ WHO2005 ND=0.5 | | 6.78 | 6.78 | pg/L | | |

| Surrogate/Tracer recovery | Qual | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | | 1830 | 2180 | pg/L | 84.0 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDD | | 2150 | 2180 | pg/L | 98.6 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDD | | 1550 | 2180 | pg/L | 71.4 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDD | | 1940 | 2180 | pg/L | 89.4 | (40%-135%) |
| 13C-OCDD | | 3760 | 4350 | pg/L | 86.5 | (40%-135%) |
| 13C-2,3,7,8-TCDF | | 1910 | 2180 | pg/L | 87.7 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDF | | 1990 | 2180 | pg/L | 91.3 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDF | | 1490 | 2180 | pg/L | 68.4 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDF | | 1660 | 2180 | pg/L | 76.2 | (40%-135%) |

**Comments:**

**U Analyte was analyzed for , but not detected above the specified detection limit.**

# Hi-Res Dioxins/Furans
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-43** | **Client:** | **LANL001** | **Project:** | **LANL00112** |
| **Lab Sample ID:** | **6730003** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **WATER** |
| **Client Sample:** | **8290 Water** | **Date Received:** | **10/08/2014 10:30** | | |
| **Client ID:** | **CAWR-14-86875** | | | **Prep Basis:** | **As Received** |
| **Batch ID:** | **27263** | **Method:** | **SW846 8290A** | | |
| **Run Date:** | **10/29/2014 15:57** | **Analyst:** | **CLP** | **Instrument:** | **HRP763** |
| **Data File:** | **b29oct14b-7** | | | **Dilution:** | **1** |
| **Prep Batch:** | **27260** | **Prep Method:** | **SW846 3520C** | | |
| **Prep Date:** | **16-OCT-14** | **Prep Aliquot:** | **919.2 mL** | | |

| CAS No. | Parmname | Qual | Result | EMPC | Units | EDL | PQL |
|---|---|---|---|---|---|---|---|
| 1746-01-6 | 2,3,7,8-TCDD | U | 1.63 | | pg/L | 1.63 | 10.9 |
| 40321-76-4 | 1,2,3,7,8-PeCDD | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 39227-28-6 | 1,2,3,4,7,8-HxCDD | U | 6.24 | | pg/L | 6.24 | 54.4 |
| 57653-85-7 | 1,2,3,6,7,8-HxCDD | U | 5.48 | | pg/L | 5.48 | 54.4 |
| 19408-74-3 | 1,2,3,7,8,9-HxCDD | U | 6.48 | | pg/L | 6.48 | 54.4 |
| 35822-46-9 | 1,2,3,4,6,7,8-HpCDD | U | 8.03 | | pg/L | 8.03 | 54.4 |
| 3268-87-9 | 1,2,3,4,6,7,8,9-OCDD | U | 10.9 | | pg/L | 10.9 | 109 |
| 51207-31-9 | 2,3,7,8-TCDF | U | 1.54 | | pg/L | 1.54 | 10.9 |
| 57117-41-6 | 1,2,3,7,8-PeCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 57117-31-4 | 2,3,4,7,8-PeCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 70648-26-9 | 1,2,3,4,7,8-HxCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 57117-44-9 | 1,2,3,6,7,8-HxCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 60851-34-5 | 2,3,4,6,7,8-HxCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 72918-21-9 | 1,2,3,7,8,9-HxCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 67562-39-4 | 1,2,3,4,6,7,8-HpCDF | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 55673-89-7 | 1,2,3,4,7,8,9-HpCDF | U | 6.88 | | pg/L | 6.88 | 54.4 |
| 39001-02-0 | 1,2,3,4,6,7,8,9-OCDF | U | 10.9 | | pg/L | 10.9 | 109 |
| 41903-57-5 | Total TCDDs | U | 1.63 | | pg/L | 1.63 | 10.9 |
| 36088-22-9 | Total PeCDDs | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 34465-46-8 | Total HxCDDs | U | 6.05 | | pg/L | 6.05 | 54.4 |
| 37871-00-4 | Total HpCDDs | U | 8.03 | | pg/L | 8.03 | 54.4 |
| 30402-14-3 | Total TCDFs | U | 1.54 | | pg/L | 1.54 | 10.9 |
| 30402-15-4 | Total PeCDFs | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 55684-94-1 | Total HxCDFs | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 38998-75-3 | Total HpCDFs | U | 5.44 | | pg/L | 5.44 | 54.4 |
| 3333-30-0 | TEQ WHO2005 ND=0 | | 0.00 | 0.00 | pg/L | | |
| 3333-30-1 | TEQ WHO2005 ND=0.5 | | 6.61 | 6.61 | pg/L | | |

| Surrogate/Tracer recovery | Qual | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | | 1760 | 2180 | pg/L | 81.1 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDD | | 2120 | 2180 | pg/L | 97.4 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDD | | 1570 | 2180 | pg/L | 72.3 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDD | | 1920 | 2180 | pg/L | 88.4 | (40%-135%) |
| 13C-OCDD | | 3430 | 4350 | pg/L | 78.9 | (40%-135%) |
| 13C-2,3,7,8-TCDF | | 1810 | 2180 | pg/L | 83.4 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDF | | 1950 | 2180 | pg/L | 89.5 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDF | | 1430 | 2180 | pg/L | 65.8 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDF | | 1610 | 2180 | pg/L | 73.9 | (40%-135%) |

**Comments:**

**U Analyte was analyzed for , but not detected above the specified detection limit.**

# Hi-Res Dioxins/Furans
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-43** | **Client:** | **LANL001** | **Project:** | **LANL00112** |
| **Lab Sample ID:** | **6730004** | **Date Collected:** | **10/06/2014 10:55** | **Matrix:** | **WATER** |
| **Client Sample:** | **8290 Water** | **Date Received:** | **10/08/2014 10:30** | | |
| **Client ID:** | **CAWR-14-86880** | | | **Prep Basis:** | **As Received** |
| **Batch ID:** | **27263** | **Method:** | **SW846 8290A** | | |
| **Run Date:** | **10/29/2014 16:45** | **Analyst:** | **CLP** | **Instrument:** | **HRP763** |
| **Data File:** | **b29oct14b-8** | | | **Dilution:** | **1** |
| **Prep Batch:** | **27260** | **Prep Method:** | **SW846 3520C** | | |
| **Prep Date:** | **16-OCT-14** | **Prep Aliquot:** | **927.4 mL** | | |

| CAS No. | Parmname | Qual | Result | EMPC | Units | EDL | PQL |
|---|---|---|---|---|---|---|---|
| 1746-01-6 | 2,3,7,8-TCDD | U | 1.52 | | pg/L | 1.52 | 10.8 |
| 40321-76-4 | 1,2,3,7,8-PeCDD | U | 5.5 | | pg/L | 5.50 | 53.9 |
| 39227-28-6 | 1,2,3,4,7,8-HxCDD | U | 8.11 | | pg/L | 8.11 | 53.9 |
| 57653-85-7 | 1,2,3,6,7,8-HxCDD | U | 7.14 | | pg/L | 7.14 | 53.9 |
| 19408-74-3 | 1,2,3,7,8,9-HxCDD | U | 8.43 | | pg/L | 8.43 | 53.9 |
| 35822-46-9 | 1,2,3,4,6,7,8-HpCDD | U | 11.8 | | pg/L | 11.8 | 53.9 |
| 3268-87-9 | 1,2,3,4,6,7,8,9-OCDD | U | 10.8 | | pg/L | 10.8 | 108 |
| 51207-31-9 | 2,3,7,8-TCDF | U | 1.48 | | pg/L | 1.48 | 10.8 |
| 57117-41-6 | 1,2,3,7,8-PeCDF | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 57117-31-4 | 2,3,4,7,8-PeCDF | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 70648-26-9 | 1,2,3,4,7,8-HxCDF | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 57117-44-9 | 1,2,3,6,7,8-HxCDF | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 60851-34-5 | 2,3,4,6,7,8-HxCDF | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 72918-21-9 | 1,2,3,7,8,9-HxCDF | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 67562-39-4 | 1,2,3,4,6,7,8-HpCDF | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 55673-89-7 | 1,2,3,4,7,8,9-HpCDF | U | 7.46 | | pg/L | 7.46 | 53.9 |
| 39001-02-0 | 1,2,3,4,6,7,8,9-OCDF | U | 10.8 | | pg/L | 10.8 | 108 |
| 41903-57-5 | Total TCDDs | U | 1.52 | | pg/L | 1.52 | 10.8 |
| 36088-22-9 | Total PeCDDs | U | 5.5 | | pg/L | 5.50 | 53.9 |
| 34465-46-8 | Total HxCDDs | U | 7.87 | | pg/L | 7.87 | 53.9 |
| 37871-00-4 | Total HpCDDs | U | 11.8 | | pg/L | 11.8 | 53.9 |
| 30402-14-3 | Total TCDFs | U | 1.48 | | pg/L | 1.48 | 10.8 |
| 30402-15-4 | Total PeCDFs | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 55684-94-1 | Total HxCDFs | U | 5.39 | | pg/L | 5.39 | 53.9 |
| 38998-75-3 | Total HpCDFs | U | 5.87 | | pg/L | 5.87 | 53.9 |
| 3333-30-0 | TEQ WHO2005 ND=0 | | 0.00 | 0.00 | pg/L | | |
| 3333-30-1 | TEQ WHO2005 ND=0.5 | | 6.86 | 6.86 | pg/L | | |

| Surrogate/Tracer recovery | Qual | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | | 1900 | 2160 | pg/L | 88.2 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDD | | 2230 | 2160 | pg/L | 103 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDD | | 1600 | 2160 | pg/L | 74.4 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDD | | 1960 | 2160 | pg/L | 90.8 | (40%-135%) |
| 13C-OCDD | | 3640 | 4310 | pg/L | 84.4 | (40%-135%) |
| 13C-2,3,7,8-TCDF | | 1920 | 2160 | pg/L | 88.9 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDF | | 2000 | 2160 | pg/L | 92.8 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDF | | 1500 | 2160 | pg/L | 69.6 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDF | | 1680 | 2160 | pg/L | 78.0 | (40%-135%) |

**Comments:**

**U Analyte was analyzed for , but not detected above the specified detection limit.**

# Quality Control Summary

# Hi-Res Dioxins/Furans



## Surrogate Recovery Report

**SDG Number: 2015-43**

**Matrix Type: LIQUID**

| Sample ID | Client ID | Surrogate | QUAL | Recovery (%) | Acceptance Limits |
|---|---|---|---|---|---|
| 12011715 | LCS for batch 27260 | 13C-2,3,7,8-TCDD | | 82.2 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDD | | 90.8 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDD | | 75.7 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDD | | 95.9 | (40%-135%) |
| | | 13C-OCDD | | 79.2 | (40%-135%) |
| | | 13C-2,3,7,8-TCDF | | 83.3 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDF | | 86.4 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDF | | 70.5 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDF | | 76.1 | (40%-135%) |
| 12011716 | LCSD for batch 27260 | 13C-2,3,7,8-TCDD | | 79.7 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDD | | 90.1 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDD | | 72.0 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDD | | 93.5 | (40%-135%) |
| | | 13C-OCDD | | 76.7 | (40%-135%) |
| | | 13C-2,3,7,8-TCDF | | 84.9 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDF | | 86.9 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDF | | 68.0 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDF | | 74.5 | (40%-135%) |
| 12011714 | MB for batch 27260 | 13C-2,3,7,8-TCDD | | 88.5 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDD | | 102 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDD | | 77.3 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDD | | 97.4 | (40%-135%) |
| | | 13C-OCDD | | 86.1 | (40%-135%) |
| | | 13C-2,3,7,8-TCDF | | 90.4 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDF | | 94.7 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDF | | 74.6 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDF | | 80.8 | (40%-135%) |
| 6730001 | CAWR-14-86939 | 13C-2,3,7,8-TCDD | | 80.8 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDD | | 100 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDD | | 75.2 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDD | | 90.1 | (40%-135%) |
| | | 13C-OCDD | | 78.1 | (40%-135%) |
| | | 13C-2,3,7,8-TCDF | | 86.6 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDF | | 91.8 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDF | | 72.2 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDF | | 76.0 | (40%-135%) |
| 6730002 | CAWR-14-86874 | 13C-2,3,7,8-TCDD | | 84.0 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDD | | 98.6 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDD | | 71.4 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDD | | 89.4 | (40%-135%) |
| | | 13C-OCDD | | 86.5 | (40%-135%) |
| | | 13C-2,3,7,8-TCDF | | 87.7 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDF | | 91.3 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDF | | 68.4 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDF | | 76.2 | (40%-135%) |
| 6730003 | CAWR-14-86875 | 13C-2,3,7,8-TCDD | | 81.1 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDD | | 97.4 | (40%-135%) |

# Hi-Res Dioxins/Furans

## Surrogate Recovery Report

**SDG Number: 2015-43**

**Matrix Type: LIQUID**

| Sample ID | Client ID | Surrogate | QUAL | Recovery (%) | Acceptance Limits |
|---|---|---|---|---|---|
| 6730003 | CAWR-14-86875 | 13C-1,2,3,6,7,8-HxCDD | | 72.3 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDD | | 88.4 | (40%-135%) |
| | | 13C-OCDD | | 78.9 | (40%-135%) |
| | | 13C-2,3,7,8-TCDF | | 83.4 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDF | | 89.5 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDF | | 65.8 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDF | | 73.9 | (40%-135%) |
| 6730004 | CAWR-14-86880 | 13C-2,3,7,8-TCDD | | 88.2 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDD | | 103 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDD | | 74.4 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDD | | 90.8 | (40%-135%) |
| | | 13C-OCDD | | 84.4 | (40%-135%) |
| | | 13C-2,3,7,8-TCDF | | 88.9 | (40%-135%) |
| | | 13C-1,2,3,7,8-PeCDF | | 92.8 | (40%-135%) |
| | | 13C-1,2,3,6,7,8-HxCDF | | 69.6 | (40%-135%) |
| | | 13C-1,2,3,4,6,7,8-HpCDF | | 78.0 | (40%-135%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Hi-Res Dioxins/Furans**

## Quality Control Summary
## Spike Recovery Report

**SDG Number:** 2015-43
**Client ID:** LCS for batch 27260
**Lab Sample ID:** 12011715
**Instrument:** HRP763
**Analyst:** CLP

**Sample Type:** Laboratory Control Sample
**Matrix:** WATER
**Analysis Date:** 10/29/2014 11:57
**Dilution:** 1
**Prep Batch ID:** 27260
**Batch ID:** 27263

| CAS No. | | Parmname | Amount Added pg/L | Spike Conc. pg/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|
| 1746-01-6 | LCS | 2,3,7,8-TCDD | 200 | 198 | 98.9 | 70-130 |
| 40321-76-4 | LCS | 1,2,3,7,8-PeCDD | 1000 | 987 | 98.7 | 70-130 |
| 39227-28-6 | LCS | 1,2,3,4,7,8-HxCDD | 1000 | 1090 | 109 | 70-130 |
| 57653-85-7 | LCS | 1,2,3,6,7,8-HxCDD | 1000 | 1020 | 102 | 70-130 |
| 19408-74-3 | LCS | 1,2,3,7,8,9-HxCDD | 1000 | 1070 | 107 | 70-130 |
| 35822-46-9 | LCS | 1,2,3,4,6,7,8-HpCDD | 1000 | 925 | 92.5 | 70-130 |
| 3268-87-9 | LCS | 1,2,3,4,6,7,8,9-OCDD | 2000 | 1970 | 98.7 | 70-130 |
| 51207-31-9 | LCS | 2,3,7,8-TCDF | 200 | 185 | 92.5 | 70-130 |
| 57117-41-6 | LCS | 1,2,3,7,8-PeCDF | 1000 | 1010 | 101 | 70-130 |
| 57117-31-4 | LCS | 2,3,4,7,8-PeCDF | 1000 | 925 | 92.5 | 70-130 |
| 70648-26-9 | LCS | 1,2,3,4,7,8-HxCDF | 1000 | 1100 | 110 | 70-130 |
| 57117-44-9 | LCS | 1,2,3,6,7,8-HxCDF | 1000 | 988 | 98.8 | 70-130 |
| 60851-34-5 | LCS | 2,3,4,6,7,8-HxCDF | 1000 | 995 | 99.5 | 70-130 |
| 72918-21-9 | LCS | 1,2,3,7,8,9-HxCDF | 1000 | 1110 | 111 | 70-130 |
| 67562-39-4 | LCS | 1,2,3,4,6,7,8-HpCDF | 1000 | 941 | 94.1 | 70-130 |
| 55673-89-7 | LCS | 1,2,3,4,7,8,9-HpCDF | 1000 | 1100 | 110 | 70-130 |
| 39001-02-0 | LCS | 1,2,3,4,6,7,8,9-OCDF | 2000 | 1880 | 93.8 | 70-130 |

**Hi-Res Dioxins/Furans**

## Quality Control Summary
## Spike Recovery Report

**SDG Number:** 2015-43
**Client ID:** LCSD for batch 27260
**Lab Sample ID:** 12011716
**Instrument:** HRP763
**Analyst:** CLP

**Sample Type:** Laboratory Control Sample Duplicate
**Matrix:** WATER
**Analysis Date:** 10/29/2014 12:45
**Dilution:** 1
**Prep Batch ID:** 27260
**Batch ID:** 27263

| CAS No. | | Parmname | Amount Added pg/L | Spike Conc. pg/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 1746-01-6 | LCSD | 2,3,7,8-TCDD | 200 | 198 | 98.8 | 70-130 | 0.0506 | 0-20 |
| 40321-76-4 | LCSD | 1,2,3,7,8-PeCDD | 1000 | 1030 | 103 | 70-130 | 4.13 | 0-20 |
| 39227-28-6 | LCSD | 1,2,3,4,7,8-HxCDD | 1000 | 1100 | 110 | 70-130 | 1.20 | 0-20 |
| 57653-85-7 | LCSD | 1,2,3,6,7,8-HxCDD | 1000 | 1020 | 102 | 70-130 | 0.135 | 0-20 |
| 19408-74-3 | LCSD | 1,2,3,7,8,9-HxCDD | 1000 | 1100 | 110 | 70-130 | 2.70 | 0-20 |
| 35822-46-9 | LCSD | 1,2,3,4,6,7,8-HpCDD | 1000 | 907 | 90.7 | 70-130 | 2.03 | 0-20 |
| 3268-87-9 | LCSD | 1,2,3,4,6,7,8,9-OCDD | 2000 | 2020 | 101 | 70-130 | 2.22 | 0-20 |
| 51207-31-9 | LCSD | 2,3,7,8-TCDF | 200 | 185 | 92.4 | 70-130 | 0.141 | 0-20 |
| 57117-41-6 | LCSD | 1,2,3,7,8-PeCDF | 1000 | 1010 | 101 | 70-130 | 0.458 | 0-20 |
| 57117-31-4 | LCSD | 2,3,4,7,8-PeCDF | 1000 | 964 | 96.4 | 70-130 | 4.13 | 0-20 |
| 70648-26-9 | LCSD | 1,2,3,4,7,8-HxCDF | 1000 | 1100 | 110 | 70-130 | 0.0327 | 0-20 |
| 57117-44-9 | LCSD | 1,2,3,6,7,8-HxCDF | 1000 | 1020 | 102 | 70-130 | 3.22 | 0-20 |
| 60851-34-5 | LCSD | 2,3,4,6,7,8-HxCDF | 1000 | 1010 | 101 | 70-130 | 1.86 | 0-20 |
| 72918-21-9 | LCSD | 1,2,3,7,8,9-HxCDF | 1000 | 1160 | 116 | 70-130 | 4.00 | 0-20 |
| 67562-39-4 | LCSD | 1,2,3,4,6,7,8-HpCDF | 1000 | 948 | 94.8 | 70-130 | 0.800 | 0-20 |
| 55673-89-7 | LCSD | 1,2,3,4,7,8,9-HpCDF | 1000 | 1090 | 109 | 70-130 | 1.21 | 0-20 |
| 39001-02-0 | LCSD | 1,2,3,4,6,7,8,9-OCDF | 2000 | 1900 | 94.8 | 70-130 | 1.01 | 0-20 |

## Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-43** | **Client:** | **LANL001** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 27260** | **Instrument ID:** | **HRP763** | **Data File:** | **b29oct14b-4** |
| **Lab Sample ID:** | **12011714** | **Prep Date:** | **16-OCT-14** | **Analyzed:** | **10/29/14 13:33** |
| **Column:** | | | | | |

**This method blank applies to the following samples and quality control samples:**

| | Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 01 | LCS for batch 27260 | 12011715 | b29oct14b-2 | 10/29/14 | 1157 |
| 02 | LCSD for batch 27260 | 12011716 | b29oct14b-3 | 10/29/14 | 1245 |
| 03 | CAWR-14-86939 | 6730001 | b29oct14b-5 | 10/29/14 | 1421 |
| 04 | CAWR-14-86874 | 6730002 | b29oct14b-6 | 10/29/14 | 1509 |
| 05 | CAWR-14-86875 | 6730003 | b29oct14b-7 | 10/29/14 | 1557 |
| 06 | CAWR-14-86880 | 6730004 | b29oct14b-8 | 10/29/14 | 1645 |

# Hi-Res Dioxins/Furans
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-43** | **Client:** | **LANL001** | **Project:** | **LANL00112** |
| **Lab Sample ID:** | **12011714** | | | **Matrix:** | **WATER** |
| **Client Sample:** | **QC for batch 27260** | | | | |
| **Client ID:** | **MB for batch 27260** | | | **Prep Basis:** | **As Received** |
| **Batch ID:** | **27263** | **Method:** | **SW846 8290A** | | |
| **Run Date:** | **10/29/2014 13:33** | **Analyst:** | **CLP** | **Instrument:** | **HRP763** |
| **Data File:** | **b29oct14b-4** | | | **Dilution:** | **1** |
| **Prep Batch:** | **27260** | **Prep Method:** | **SW846 3520C** | | |
| **Prep Date:** | **16-OCT-14** | **Prep Aliquot:** | **1000 mL** | | |

| CAS No. | Parmname | Qual | Result | EMPC | Units | EDL | PQL |
|---|---|---|---|---|---|---|---|
| 1746-01-6 | 2,3,7,8-TCDD | U | 2.28 | | pg/L | 2.28 | 10.0 |
| 40321-76-4 | 1,2,3,7,8-PeCDD | U | 5 | | pg/L | 5.00 | 50.0 |
| 39227-28-6 | 1,2,3,4,7,8-HxCDD | U | 10.7 | | pg/L | 10.7 | 50.0 |
| 57653-85-7 | 1,2,3,6,7,8-HxCDD | U | 9.44 | | pg/L | 9.44 | 50.0 |
| 19408-74-3 | 1,2,3,7,8,9-HxCDD | U | 11.2 | | pg/L | 11.2 | 50.0 |
| 35822-46-9 | 1,2,3,4,6,7,8-HpCDD | U | 15.2 | | pg/L | 15.2 | 50.0 |
| 3268-87-9 | 1,2,3,4,6,7,8,9-OCDD | U | 17.1 | | pg/L | 17.1 | 100 |
| 51207-31-9 | 2,3,7,8-TCDF | U | 2.04 | | pg/L | 2.04 | 10.0 |
| 57117-41-6 | 1,2,3,7,8-PeCDF | U | 5 | | pg/L | 5.00 | 50.0 |
| 57117-31-4 | 2,3,4,7,8-PeCDF | U | 5 | | pg/L | 5.00 | 50.0 |
| 70648-26-9 | 1,2,3,4,7,8-HxCDF | U | 5.1 | | pg/L | 5.10 | 50.0 |
| 57117-44-9 | 1,2,3,6,7,8-HxCDF | U | 5 | | pg/L | 5.00 | 50.0 |
| 60851-34-5 | 2,3,4,6,7,8-HxCDF | U | 5 | | pg/L | 5.00 | 50.0 |
| 72918-21-9 | 1,2,3,7,8,9-HxCDF | U | 6.66 | | pg/L | 6.66 | 50.0 |
| 67562-39-4 | 1,2,3,4,6,7,8-HpCDF | U | 7.54 | | pg/L | 7.54 | 50.0 |
| 55673-89-7 | 1,2,3,4,7,8,9-HpCDF | U | 11.6 | | pg/L | 11.6 | 50.0 |
| 39001-02-0 | 1,2,3,4,6,7,8,9-OCDF | U | 41.8 | | pg/L | 41.8 | 100 |
| 41903-57-5 | Total TCDDs | U | 2.28 | | pg/L | 2.28 | 10.0 |
| 36088-22-9 | Total PeCDDs | U | 5 | | pg/L | 5.00 | 50.0 |
| 34465-46-8 | Total HxCDDs | U | 10.4 | | pg/L | 10.4 | 50.0 |
| 37871-00-4 | Total HpCDDs | U | 15.2 | | pg/L | 15.2 | 50.0 |
| 30402-14-3 | Total TCDFs | U | 2.04 | | pg/L | 2.04 | 10.0 |
| 30402-15-4 | Total PeCDFs | U | 5 | | pg/L | 5.00 | 50.0 |
| 55684-94-1 | Total HxCDFs | U | 5.08 | | pg/L | 5.08 | 50.0 |
| 38998-75-3 | Total HpCDFs | U | 9.14 | | pg/L | 9.14 | 50.0 |
| 3333-30-0 | TEQ WHO2005 ND=0 | | 0.00 | 0.00 | pg/L | | |
| 3333-30-1 | TEQ WHO2005 ND=0.5 | | 7.40 | 7.40 | pg/L | | |

| Surrogate/Tracer recovery | Qual | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | | 1770 | 2000 | pg/L | 88.5 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDD | | 2040 | 2000 | pg/L | 102 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDD | | 1550 | 2000 | pg/L | 77.3 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDD | | 1950 | 2000 | pg/L | 97.4 | (40%-135%) |
| 13C-OCDD | | 3440 | 4000 | pg/L | 86.1 | (40%-135%) |
| 13C-2,3,7,8-TCDF | | 1810 | 2000 | pg/L | 90.4 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDF | | 1890 | 2000 | pg/L | 94.7 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDF | | 1490 | 2000 | pg/L | 74.6 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDF | | 1620 | 2000 | pg/L | 80.8 | (40%-135%) |

**Comments:**

**U Analyte was analyzed for , but not detected above the specified detection limit.**

# Hi-Res Dioxins/Furans
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-43** | **Client:** | **LANL001** | **Project:** | **LANL00112** |
| **Lab Sample ID:** | **12011715** | | | **Matrix:** | **WATER** |
| **Client Sample:** | **QC for batch 27260** | | | | |
| **Client ID:** | **LCS for batch 27260** | | | **Prep Basis:** | **As Received** |
| **Batch ID:** | **27263** | **Method:** | **SW846 8290A** | | |
| **Run Date:** | **10/29/2014 11:57** | **Analyst:** | **CLP** | **Instrument:** | **HRP763** |
| **Data File:** | **b29oct14b-2** | | | **Dilution:** | **1** |
| **Prep Batch:** | **27260** | **Prep Method:** | **SW846 3520C** | | |
| **Prep Date:** | **16-OCT-14** | **Prep Aliquot:** | **1000 mL** | | |

| CAS No. | Parmname | Qual | Result | EMPC | Units | EDL | PQL |
|---|---|---|---|---|---|---|---|
| 1746-01-6 | 2,3,7,8-TCDD | | 198 | | pg/L | 2.22 | 10.0 |
| 40321-76-4 | 1,2,3,7,8-PeCDD | | 987 | | pg/L | 7.92 | 50.0 |
| 39227-28-6 | 1,2,3,4,7,8-HxCDD | | 1090 | | pg/L | 13.9 | 50.0 |
| 57653-85-7 | 1,2,3,6,7,8-HxCDD | | 1020 | | pg/L | 12.2 | 50.0 |
| 19408-74-3 | 1,2,3,7,8,9-HxCDD | | 1070 | | pg/L | 14.4 | 50.0 |
| 35822-46-9 | 1,2,3,4,6,7,8-HpCDD | | 925 | | pg/L | 21.4 | 50.0 |
| 3268-87-9 | 1,2,3,4,6,7,8,9-OCDD | | 1970 | | pg/L | 39.0 | 100 |
| 51207-31-9 | 2,3,7,8-TCDF | | 185 | | pg/L | 2.78 | 10.0 |
| 57117-41-6 | 1,2,3,7,8-PeCDF | | 1010 | | pg/L | 5.00 | 50.0 |
| 57117-31-4 | 2,3,4,7,8-PeCDF | | 925 | | pg/L | 5.00 | 50.0 |
| 70648-26-9 | 1,2,3,4,7,8-HxCDF | | 1100 | | pg/L | 9.64 | 50.0 |
| 57117-44-9 | 1,2,3,6,7,8-HxCDF | | 988 | | pg/L | 8.16 | 50.0 |
| 60851-34-5 | 2,3,4,6,7,8-HxCDF | | 995 | | pg/L | 8.98 | 50.0 |
| 72918-21-9 | 1,2,3,7,8,9-HxCDF | | 1110 | | pg/L | 12.6 | 50.0 |
| 67562-39-4 | 1,2,3,4,6,7,8-HpCDF | | 941 | | pg/L | 14.9 | 50.0 |
| 55673-89-7 | 1,2,3,4,7,8,9-HpCDF | | 1100 | | pg/L | 22.8 | 50.0 |
| 39001-02-0 | 1,2,3,4,6,7,8,9-OCDF | | 1880 | | pg/L | 65.2 | 100 |

| Surrogate/Tracer recovery | Qual | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | | 1640 | 2000 | pg/L | 82.2 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDD | | 1820 | 2000 | pg/L | 90.8 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDD | | 1510 | 2000 | pg/L | 75.7 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDD | | 1920 | 2000 | pg/L | 95.9 | (40%-135%) |
| 13C-OCDD | | 3170 | 4000 | pg/L | 79.2 | (40%-135%) |
| 13C-2,3,7,8-TCDF | | 1670 | 2000 | pg/L | 83.3 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDF | | 1730 | 2000 | pg/L | 86.4 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDF | | 1410 | 2000 | pg/L | 70.5 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDF | | 1520 | 2000 | pg/L | 76.1 | (40%-135%) |

**Comments:**

**K Estimated Maximum Possible Concentration**

# Hi-Res Dioxins/Furans
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-43** | **Client:** | **LANL001** | **Project:** | **LANL00112** |
| **Lab Sample ID:** | **12011716** | | | **Matrix:** | **WATER** |
| **Client Sample:** | **QC for batch 27260** | | | | |
| **Client ID:** | **LCSD for batch 27260** | | | **Prep Basis:** | **As Received** |
| **Batch ID:** | **27263** | **Method:** | **SW846 8290A** | | |
| **Run Date:** | **10/29/2014 12:45** | **Analyst:** | **CLP** | **Instrument:** | **HRP763** |
| **Data File:** | **b29oct14b-3** | | | **Dilution:** | **1** |
| **Prep Batch:** | **27260** | **Prep Method:** | **SW846 3520C** | | |
| **Prep Date:** | **16-OCT-14** | **Prep Aliquot:** | **1000 mL** | | |

| CAS No. | Parmname | Qual | Result | EMPC | Units | EDL | PQL |
|---|---|---|---|---|---|---|---|
| 1746-01-6 | 2,3,7,8-TCDD | | 198 | | pg/L | 2.86 | 10.0 |
| 40321-76-4 | 1,2,3,7,8-PeCDD | | 1030 | | pg/L | 7.06 | 50.0 |
| 39227-28-6 | 1,2,3,4,7,8-HxCDD | | 1100 | | pg/L | 15.2 | 50.0 |
| 57653-85-7 | 1,2,3,6,7,8-HxCDD | | 1020 | | pg/L | 13.4 | 50.0 |
| 19408-74-3 | 1,2,3,7,8,9-HxCDD | | 1100 | | pg/L | 15.8 | 50.0 |
| 35822-46-9 | 1,2,3,4,6,7,8-HpCDD | | 907 | | pg/L | 22.6 | 50.0 |
| 3268-87-9 | 1,2,3,4,6,7,8,9-OCDD | | 2020 | | pg/L | 39.0 | 100 |
| 51207-31-9 | 2,3,7,8-TCDF | | 185 | | pg/L | 2.68 | 10.0 |
| 57117-41-6 | 1,2,3,7,8-PeCDF | | 1010 | | pg/L | 5.00 | 50.0 |
| 57117-31-4 | 2,3,4,7,8-PeCDF | | 964 | | pg/L | 5.00 | 50.0 |
| 70648-26-9 | 1,2,3,4,7,8-HxCDF | | 1100 | | pg/L | 10.1 | 50.0 |
| 57117-44-9 | 1,2,3,6,7,8-HxCDF | | 1020 | | pg/L | 8.52 | 50.0 |
| 60851-34-5 | 2,3,4,6,7,8-HxCDF | | 1010 | | pg/L | 9.38 | 50.0 |
| 72918-21-9 | 1,2,3,7,8,9-HxCDF | | 1160 | | pg/L | 13.1 | 50.0 |
| 67562-39-4 | 1,2,3,4,6,7,8-HpCDF | | 948 | | pg/L | 14.2 | 50.0 |
| 55673-89-7 | 1,2,3,4,7,8,9-HpCDF | | 1090 | | pg/L | 22.0 | 50.0 |
| 39001-02-0 | 1,2,3,4,6,7,8,9-OCDF | | 1900 | | pg/L | 66.8 | 100 |

| Surrogate/Tracer recovery | Qual | Result | Nominal | Units | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | | 1590 | 2000 | pg/L | 79.7 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDD | | 1800 | 2000 | pg/L | 90.1 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDD | | 1440 | 2000 | pg/L | 72.0 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDD | | 1870 | 2000 | pg/L | 93.5 | (40%-135%) |
| 13C-OCDD | | 3070 | 4000 | pg/L | 76.7 | (40%-135%) |
| 13C-2,3,7,8-TCDF | | 1700 | 2000 | pg/L | 84.9 | (40%-135%) |
| 13C-1,2,3,7,8-PeCDF | | 1740 | 2000 | pg/L | 86.9 | (40%-135%) |
| 13C-1,2,3,6,7,8-HxCDF | | 1360 | 2000 | pg/L | 68.0 | (40%-135%) |
| 13C-1,2,3,4,6,7,8-HpCDF | | 1490 | 2000 | pg/L | 74.5 | (40%-135%) |

**Comments:**

**K Estimated Maximum Possible Concentration**

Shealy Labs
106 Vantage Point Drive
West Columbia SC 19172
803-227-3150

# Chain of Custody/Analysis Request

ARP

COC/Lab Request #: 2015-44



Client Contact:

Lab Agreement # :

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-8260B | WSP-LL-8260B-TB | WSP-LL-8270C |
|---|---|---|---|---|---|---|
| CAWR-14-86935 | Oct 6 2014 | 09:40 | W | 2 | | 1 |
| CAWR-14-86912 | Oct 6 2014 | 09:40 | W | | 1 | |
| CAWR-14-86939 | Oct 6 2014 | 10:55 | W | 2 | | 1 |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 2 | 1 | 1 |
| CAWR-14-86875 | Oct 6 2014 | 10:55 | W | 2 | | 1 |
| CAWR-14-86880 | Oct 6 2014 | 10:55 | W | 2 | | 1 |
| CAWR-14-86910 | Oct 6 2014 | 10:55 | W | | 1 | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | Melissa Montoya | 10/7/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 10/06/2014 | **FIELD MATRIX:** | WS | ok |
| **TIME COLLECTED (HH:MM):** | | 1235 | **MEDIA:** | UA | |
| **PRS ID:** | | ok | **SAMPLE TECH CODE:** | UA | DC |
| **LOCATION ID:** | Rio Grande at Otowi Bridge | | **FIELD PREP:** | UF | ok |
| **LOCATION TYPE:** | | | **FIELD QC TYPE:** | PEB | |
| **TOP DEPTH:** | | | **SAMPLE USAGE:** | QC | |
| **BOTTOM DEPTH:** | | | **EXCAVATED:** | | YES / ~~NO~~ / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | ~~WSP-8011-TB~~ | ~~40 ML SEPTUM GLASS~~ | ~~1~~ | ~~HCL~~ DF 10/6/14 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS AT 8/3/14 | ~~2~~ 1 | ICE | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS AT 8/3/14 | ~~2~~ 1 | ICE | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS AT 8/3/14 | ~~2~~ 1 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS AT 8/3/14 | ~~2~~ 1 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS AT 8/3/14 | ~~2~~ 1 | ICE | | |
| | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-CN(T) | 250 ML POLY | 1 | NAOH | Y | NA |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 1 | ICE AT 8/3/14 | | |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | ~~WSP-LL-8260B-TB~~ | ~~40 ML SEPTUM GLASS~~ | ~~1~~ | ~~ICE~~ OF 10/6/14 | | |
| NA | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | Y | NA |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | Y | NA |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Shaw

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86875

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/08/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FB | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | QC | ↓ |
| BOTTOM DEPTH: | | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | Y | NA |
| ↓ | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8290-D/F | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-8310-PAH | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86875

**WORK ORDER:**

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Stone + A. Stocker

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** Andrew Stocker | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** M. Martin | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86880

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | FD | |
| TOP DEPTH: | | | SAMPLE USAGE: | QC | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | ~~3~~ 2 | HCL DF 10/3/14 | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE DF 10/3/14 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86880

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

JS 10/6/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** Co Stew

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Rodney Stocker | 10/6/14 1305 | | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86910

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | QC |
| LOCATION ID: | Rio Grande at Otowi Bridge | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FTB | ↓ |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | QC | ↓ |
| BOTTOM DEPTH: | | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | NA |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | ~~2~~ 1 | HCL DF 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ HCL | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

JS 10/6/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Stocker

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Aubrey Stocker | 10/6/14 1305 | [illegible] | 10/6/14 1305 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
| | | | |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86912

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 0940 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | La Mesita Spring | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FTB | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | QC | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | NA |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | ~~2~~ 1 | HCL AT 10/3/14 | ↓ | ↓ |
| ↓ | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ HCL AT 10/3/14 | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/6/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm ~~Temperature~~ _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** C. Stoan

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stoker | 10/6/14 1305 | Martin | 10/6/14 1305 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86935

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 0940 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | La Mesita Spring | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | SPR | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| ↓ | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | ↓ | ↓ |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86935

**WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-RAD | 1 GAL POLY | 1 | HNO3 | Y | NA |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.13 mg/L  Flow (in gpm) 0.4 GPM  Oxidation-Reduction Potential NA mV

pH 7.89 SU  Specific Conductance 316 uS/cm  Temperature 17.80 deg C

Turbidity 5.1 NTU

**COLLECTED BY (PRINT)** W. Shaw + D. Fellenz

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stocker | 10/6/14 1305 | | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86939

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1055 | MEDIA: | WS | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | RC |
| LOCATION ID: | Rio Grande at Otowi Bridge | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | WCS | | FIELD QC TYPE: | REG | |
| TOP DEPTH: | | ↓ | SAMPLE USAGE: | INV | ↓ |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS | 3 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86939

**WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.75 mg/L Flow (in gpm) 291,740 GPM Oxidation-Reduction Potential NA mV

pH 8.27 SU Specific Conductance 325 uS/cm Temperature 13.80 deg C

Turbidity 79.8 NTU

**COLLECTED BY (PRINT)** W. Stan

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stacke | 10/6/14 1305 | M. Martin | 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-44

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| PJ08106 | SW-846:8260B | 2 | 1 | 2 | 1 | |
| PJ08106 | SW-846:8270D | 2 | 1 | | 1 | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PJ08106 | SW-846:8260B | 58444 | NA | 2 | | 1 | 1 | | 1 | | | | | 1 | 1 | | | | | | |
| PJ08106 | SW-846:8260B | 58670 | NA | | 1 | 1 | | | 1 | | | | | 1 | 1 | | | | | | |
| PJ08106 | SW-846:8270D | 58401 | 58138 | 2 | 1 | | 1 | | 1 | | | | | 1 | | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8260B | VOC | null | PQ58444-001 | MB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | null | PQ58444-002 | LCS | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | null | PQ58444-003 | LCSD | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | null | PQ58670-001 | MB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | null | PQ58670-002 | LCS | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | null | PQ58670-003 | LCSD | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | CAWR-14-86874 | PJ08106-004 | PEB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86875 | PJ08106-005 | FB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86880 | PJ08106-006 | FD | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86910 | PJ08106-007 | FTB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86912 | PJ08106-002 | FTB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86935 | PJ08106-001 | REG | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-86939 | PJ08106-003 | REG | 5 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | null | PQ58138-001 | MB | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | null | PQ58138-002 | LCS | 0 | 6 | 10 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86874 | PJ08106-004 | PEB | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86875 | PJ08106-005 | FB | 13 | 6 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8270D | SVOC | CAWR-14-86880 | PJ08106-006 | FD | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86935 | PJ08106-001 | REG | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-86939 | PJ08106-003 | REG | 13 | 6 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

# DATA VALIDATION REPORT

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PQ58138-002 | | SW-846:8270D | Atrazine | 58138 | 10-15-2014 | W | 22 | | 130 | 70 | | | | |
| PQ58138-002 | | SW-846:8270D | Benzidine | 58138 | 10-15-2014 | W | 4.7 | | 115 | 10 | | | | |
| PQ58138-002 | | SW-846:8270D | Dichlorobenzidine[3,3'-] | 58138 | 10-15-2014 | W | 41 | | 118 | 53 | | | | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86874 | PEB | INIT | SVOC | SW-846:8270D | Atrazine | U | UJ | SV12a | N | 5.3 | ug/L | 5.3 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86874 | PEB | INIT | SVOC | SW-846:8270D | Benzidine | U | UJ | SV12a | N | 26 | ug/L | 26 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86874 | PEB | INIT | SVOC | SW-846:8270D | Dichlorobenzidine[3,3'-] | U | UJ | SV12a | N | 26 | ug/L | 26 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86875 | FB | INIT | SVOC | SW-846:8270D | Atrazine | U | UJ | SV12a | N | 11 | ug/L | 11 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86875 | FB | INIT | SVOC | SW-846:8270D | Benzidine | U | UJ | SV12a | N | 53 | ug/L | 53 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86875 | FB | INIT | SVOC | SW-846:8270D | Dichlorobenzidine[3,3'-] | U | UJ | SV12a | N | 53 | ug/L | 53 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86880 | FD | INIT | SVOC | SW-846:8270D | Atrazine | U | UJ | SV12a | N | 11 | ug/L | 11 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86880 | FD | INIT | SVOC | SW-846:8270D | Benzidine | U | UJ | SV12a | N | 53 | ug/L | 53 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86880 | FD | INIT | SVOC | SW-846:8270D | Dichlorobenzidine[3,3'-] | U | UJ | SV12a | N | 53 | ug/L | 53 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| La Mesita Spring | 2015-44 | CAWR-14-86935 | REG | INIT | SVOC | SW-846:8270D | Atrazine | U | UJ | SV12a | N | 5.3 | ug/L | 5.3 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| La Mesita Spring | 2015-44 | CAWR-14-86935 | REG | INIT | SVOC | SW-846:8270D | Benzidine | U | UJ | SV12a | N | 26 | ug/L | 26 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| La Mesita Spring | 2015-44 | CAWR-14-86935 | REG | INIT | SVOC | SW-846:8270D | Dichlorobenzidine[3,3'-] | U | UJ | SV12a | N | 26 | ug/L | 26 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Atrazine | U | UJ | SV12a | N | 5.3 | ug/L | 5.3 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Benzidine | U | UJ | SV12a | N | 26 | ug/L | 26 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |
| Rio Grande at Otowi Bridge | 2015-44 | CAWR-14-86939 | REG | INIT | SVOC | SW-846:8270D | Dichlorobenzidine[3,3'-] | U | UJ | SV12a | N | 26 | ug/L | 26 | ug/L | | | W | 10/06/2014 | | 58401 | VAL | Y |

| Reason Code | Description |
|---|---|
| SV12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8260B | 0 | 5 |
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | SW-846:8270D | 0 | 13 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8260B | 0 | 5 |
| CAWR-14-86875 | Rio Grande at Otowi Bridge | FB | SW-846:8270D | 0 | 13 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8260B | 0 | 5 |
| CAWR-14-86880 | Rio Grande at Otowi Bridge | FD | SW-846:8270D | 0 | 13 |
| CAWR-14-86910 | Rio Grande at Otowi Bridge | FTB | SW-846:8260B | 0 | 5 |
| CAWR-14-86912 | La Mesita Spring | FTB | SW-846:8260B | 0 | 5 |
| CAWR-14-86935 | La Mesita Spring | REG | SW-846:8260B | 0 | 5 |
| CAWR-14-86935 | La Mesita Spring | REG | SW-846:8270D | 0 | 13 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8260B | 0 | 5 |
| CAWR-14-86939 | Rio Grande at Otowi Bridge | REG | SW-846:8270D | 0 | 13 |

# SHEALY ENVIRONMENTAL SERVICES, INC.

## Report of Analysis

Los Alamos National Lab
TA-3 SM-271 Drop Point O2U
Los Alamos, NM 87545
Attention: Keith Greene

Lot Number:PJ08106

Date Completed:10/20/2014

Grant Wilton
Project Manager

This report shall not be reproduced, except in its entirety, without the written approval of Shealy Environmental Services, Inc.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

* P J 0 8 1 0 6 *

# Case Narrative
## Los Alamos National Lab
### Lot Number: PJ08106

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Receiving
Sample receipt temperature - 6.4 degrees C.

Semivolatile Organic Analysis - Method 8270D
Batch 58138: Atrazine, Benzidine, 3,3-Dichlorobenzidine recovered below control limit. No sample remained for re-analysis.
Batch 58138: Benzidine recovered above control limit in Initial Calibration Verification (ICV).

# Sample Summary
## Los Alamos National Lab
### Lot Number: PJ08106

| Sample Number | Sample ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| 001 | CAWR-14-86935 | Aqueous | 10/06/2014 0940 | 10/08/2014 |
| 002 | CAWR-14-86912 | Aqueous | 10/06/2014 0940 | 10/08/2014 |
| 003 | CAWR-14-86939 | Aqueous | 10/06/2014 1055 | 10/08/2014 |
| 004 | CAWR-14-86874 | Aqueous | 10/06/2014 1235 | 10/08/2014 |
| 005 | CAWR-14-86875 | Aqueous | 10/06/2014 1055 | 10/08/2014 |
| 006 | CAWR-14-86880 | Aqueous | 10/06/2014 1055 | 10/08/2014 |
| 007 | CAWR-14-86910 | Aqueous | 10/06/2014 1055 | 10/08/2014 |

(7 samples)

# Executive Summary

## Los Alamos National Lab

Lot Number: PJ08106

| Sample | Sample ID | Matrix | Parameter | Method | Result | Q | Units | Page |
|---|---|---|---|---|---|---|---|---|

(0 detections)

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-001
Description: CAWR-14-86935
Matrix: Aqueous
Date Sampled: 10/06/2014 0940
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/16/2014 0504 | PMM2 | | 58444 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 87 | 70-130 |
| Bromofluorobenzene | | 88 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-001
Description: CAWR-14-86935
Matrix: Aqueous
Date Sampled: 10/06/2014 0940
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/15/2014 1455 | DRB1 | 10/13/2014 0938 | 58138 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 26 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.3 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 26 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 26 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.3 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 102 | 41-144 |
| 2-Fluorobiphenyl | | 97 | 37-129 |
| 2-Fluorophenol | | 91 | 24-127 |
| Nitrobenzene-d5 | | 97 | 38-127 |
| Phenol-d5 | | 89 | 28-128 |
| Terphenyl-d14 | | 100 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-002
Description: CAWR-14-86912
Matrix: Aqueous
Date Sampled: 10/06/2014 0940
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/16/2014 0055 | PMM2 | | 58444 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 86 | 70-130 |
| Bromofluorobenzene | | 90 | 70-130 |
| Toluene-d8 | | 95 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-003
Description: CAWR-14-86939
Matrix: Aqueous
Date Sampled: 10/06/2014 1055
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/16/2014 0527 | PMM2 | | 58444 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 88 | 70-130 |
| Bromofluorobenzene | | 88 | 70-130 |
| Toluene-d8 | | 95 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-003
Description: CAWR-14-86939
Matrix: Aqueous
Date Sampled: 10/06/2014 1055
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/15/2014 1523 | DRB1 | 10/13/2014 0938 | 58138 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 26 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.3 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 26 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 26 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.3 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 95 | 41-144 |
| 2-Fluorobiphenyl | | 98 | 37-129 |
| 2-Fluorophenol | | 88 | 24-127 |
| Nitrobenzene-d5 | | 97 | 38-127 |
| Phenol-d5 | | 86 | 28-128 |
| Terphenyl-d14 | | 85 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-004
Description: CAWR-14-86874
Matrix: Aqueous
Date Sampled: 10/06/2014 1235
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/16/2014 0550 | PMM2 | | 58444 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 87 | 70-130 |
| Bromofluorobenzene | | 88 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-004
Description: CAWR-14-86874
Matrix: Aqueous
Date Sampled: 10/06/2014 1235
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/15/2014 1550 | DRB1 | 10/13/2014 0938 | 58138 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 26 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.3 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 26 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 26 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.3 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.3 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 99 | 41-144 |
| 2-Fluorobiphenyl | | 99 | 37-129 |
| 2-Fluorophenol | | 87 | 24-127 |
| Nitrobenzene-d5 | | 96 | 38-127 |
| Phenol-d5 | | 88 | 28-128 |
| Terphenyl-d14 | | 99 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-005
Description: CAWR-14-86875
Matrix: Aqueous
Date Sampled: 10/06/2014 1055
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/16/2014 0613 | PMM2 | | 58444 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 88 | 70-130 |
| Bromofluorobenzene | | 87 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-005
Description: CAWR-14-86875
Matrix: Aqueous
Date Sampled: 10/06/2014 1055
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/15/2014 1617 | DRB1 | 10/13/2014 0938 | 58138 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 11 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 53 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 11 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 11 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 53 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 53 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 11 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 11 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 92 | 41-144 |
| 2-Fluorobiphenyl | | 91 | 37-129 |
| 2-Fluorophenol | | 81 | 24-127 |
| Nitrobenzene-d5 | | 90 | 38-127 |
| Phenol-d5 | | 82 | 28-128 |
| Terphenyl-d14 | | 94 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-006
Description: CAWR-14-86880
Matrix: Aqueous
Date Sampled: 10/06/2014 1055
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/19/2014 1825 | EH1 | | 58670 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 107 | 70-130 |
| Bromofluorobenzene | | 106 | 70-130 |
| Toluene-d8 | | 107 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-006
Description: CAWR-14-86880
Matrix: Aqueous
Date Sampled: 10/06/2014 1055
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 10/15/2014 1644 | DRB1 | 10/13/2014 0938 | 58138 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 11 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 53 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 11 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 11 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 53 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 53 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 11 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 11 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 11 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 92 | 41-144 |
| 2-Fluorobiphenyl | | 93 | 37-129 |
| 2-Fluorophenol | | 85 | 24-127 |
| Nitrobenzene-d5 | | 92 | 38-127 |
| Phenol-d5 | | 84 | 28-128 |
| Terphenyl-d14 | | 82 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PJ08106-007
Description: CAWR-14-86910
Matrix: Aqueous
Date Sampled: 10/06/2014 1055
Date Received: 10/08/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 10/19/2014 1848 | EH1 | | 58670 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 106 | 70-130 |
| Bromofluorobenzene | | 106 | 70-130 |
| Toluene-d8 | | 106 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# QC Summary

# Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ58444-001
Batch: 58444
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| Acrolein | ND | | 1 | 50 | ug/L | 10/16/2014 0032 |
| Acrylonitrile | ND | | 1 | 50 | ug/L | 10/16/2014 0032 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | ND | | 1 | 5.0 | ug/L | 10/16/2014 0032 |
| Methacrylonitrile | ND | | 1 | 5.0 | ug/L | 10/16/2014 0032 |
| 1,2,3-Trichloropropane | ND | | 1 | 5.0 | ug/L | 10/16/2014 0032 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 88 | 70-130 |
| 1,2-Dichloroethane-d4 | | 87 | 70-130 |
| Toluene-d8 | | 95 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ58444-002
Batch: 58444
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 580 | | 1 | 117 | 60-140 | 10/15/2014 2259 |
| Acrylonitrile | 100 | 100 | | 1 | 100 | 70-130 | 10/15/2014 2259 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 54 | | 1 | 107 | 70-130 | 10/15/2014 2259 |
| Methacrylonitrile | 50 | 46 | | 1 | 92 | 70-130 | 10/15/2014 2259 |
| 1,2,3-Trichloropropane | 50 | 45 | | 1 | 90 | 70-130 | 10/15/2014 2259 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 90 | 70-130 |
| 1,2-Dichloroethane-d4 | | 85 | 70-130 |
| Toluene-d8 | | 94 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - LCSD

Sample ID: PQ58444-003
Batch: 58444
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | % Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 600 | | 1 | 121 | 3.4 | 60-140 | 20 | 10/15/2014 2321 |
| Acrylonitrile | 100 | 110 | | 1 | 106 | 6.4 | 70-130 | 20 | 10/15/2014 2321 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 52 | | 1 | 104 | 3.0 | 70-130 | 20 | 10/15/2014 2321 |
| Methacrylonitrile | 50 | 47 | | 1 | 93 | 1.5 | 70-130 | 20 | 10/15/2014 2321 |
| 1,2,3-Trichloropropane | 50 | 47 | | 1 | 94 | 4.5 | 70-130 | 20 | 10/15/2014 2321 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 89 | 70-130 |
| 1,2-Dichloroethane-d4 | | 85 | 70-130 |
| Toluene-d8 | | 95 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ58670-001
Batch: 58670
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| Acrolein | ND | | 1 | 50 | ug/L | 10/19/2014 1218 |
| Acrylonitrile | ND | | 1 | 50 | ug/L | 10/19/2014 1218 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | ND | | 1 | 5.0 | ug/L | 10/19/2014 1218 |
| Methacrylonitrile | ND | | 1 | 5.0 | ug/L | 10/19/2014 1218 |
| 1,2,3-Trichloropropane | ND | | 1 | 5.0 | ug/L | 10/19/2014 1218 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 104 | 70-130 |
| 1,2-Dichloroethane-d4 | | 103 | 70-130 |
| Toluene-d8 | | 107 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ58670-002
Batch: 58670
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 510 | | 1 | 102 | 60-140 | 10/19/2014 1046 |
| Acrylonitrile | 100 | 99 | | 1 | 99 | 70-130 | 10/19/2014 1046 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 51 | | 1 | 102 | 70-130 | 10/19/2014 1046 |
| Methacrylonitrile | 50 | 49 | | 1 | 98 | 70-130 | 10/19/2014 1046 |
| 1,2,3-Trichloropropane | 50 | 48 | | 1 | 95 | 70-130 | 10/19/2014 1046 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 103 | 70-130 |
| 1,2-Dichloroethane-d4 | | 99 | 70-130 |
| Toluene-d8 | | 104 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - LCSD

Sample ID: PQ58670-003
Batch: 58670
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | % Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 570 | | 1 | 114 | 11 | 60-140 | 20 | 10/19/2014 1109 |
| Acrylonitrile | 100 | 110 | | 1 | 106 | 7.2 | 70-130 | 20 | 10/19/2014 1109 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 50 | | 1 | 101 | 0.87 | 70-130 | 20 | 10/19/2014 1109 |
| Methacrylonitrile | 50 | 52 | | 1 | 103 | 5.6 | 70-130 | 20 | 10/19/2014 1109 |
| 1,2,3-Trichloropropane | 50 | 50 | | 1 | 100 | 5.2 | 70-130 | 20 | 10/19/2014 1109 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 105 | 70-130 |
| 1,2-Dichloroethane-d4 | | 101 | 70-130 |
| Toluene-d8 | | 104 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ58138-001
Batch: 58138
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 10/13/2014 938

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| 1,2-Diphenylhydrazine(as azobenzene) | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| 3,3'-Dichlorobenzidine | ND | | 1 | 25 | ug/L | 10/15/2014 1402 |
| 4,6-Dinitro-2-methylphenol | ND | | 1 | 25 | ug/L | 10/15/2014 1402 |
| Atrazine | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| Benzidine | ND | | 1 | 25 | ug/L | 10/15/2014 1402 |
| bis(2-Chloroethyl)ether | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| bis(2-Chloroisopropyl)ether | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| Hexachlorobenzene | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| N-Nitroso-di-butylamine | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| N-Nitrosodi-n-propylamine | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| N-Nitrosodiethylamine | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| N-Nitrosodimethylamine | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |
| N-Nitrosopyrrolidine | ND | | 1 | 5.0 | ug/L | 10/15/2014 1402 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 91 | 41-144 |
| 2-Fluorobiphenyl | | 94 | 37-129 |
| 2-Fluorophenol | | 86 | 24-127 |
| Nitrobenzene-d5 | | 92 | 38-127 |
| Phenol-d5 | | 83 | 28-128 |
| Terphenyl-d14 | | 96 | 10-148 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ58138-002
Batch: 58138
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 10/13/2014 938

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,2-Diphenylhydrazine(as azobenzene) | 100 | 89 | | 1 | 89 | 51-116 | 10/15/2014 1429 |
| 3,3'-Dichlorobenzidine | 200 | 81 | N | 1 | 41 | 53-118 | 10/15/2014 1429 |
| 4,6-Dinitro-2-methylphenol | 500 | 530 | | 1 | 106 | 46-134 | 10/15/2014 1429 |
| Atrazine | 100 | 22 | N | 1 | 22 | 70-130 | 10/15/2014 1429 |
| Benzidine | 200 | 9.3 | N | 1 | 4.7 | 10-115 | 10/15/2014 1429 |
| bis(2-Chloroethyl)ether | 100 | 97 | | 1 | 97 | 35-114 | 10/15/2014 1429 |
| bis(2-Chloroisopropyl)ether | 100 | 91 | | 1 | 91 | 34-110 | 10/15/2014 1429 |
| Hexachlorobenzene | 100 | 100 | | 1 | 104 | 49-128 | 10/15/2014 1429 |
| N-Nitrosodi-n-propylamine | 100 | 110 | | 1 | 106 | 39-119 | 10/15/2014 1429 |
| N-Nitrosodimethylamine | 100 | 98 | | 1 | 98 | 36-118 | 10/15/2014 1429 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 112 | 41-144 |
| 2-Fluorobiphenyl | | 95 | 37-129 |
| 2-Fluorophenol | | 94 | 24-127 |
| Nitrobenzene-d5 | | 102 | 38-127 |
| Phenol-d5 | | 91 | 28-128 |
| Terphenyl-d14 | | 106 | 10-148 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Labs
106 Vantage Point Drive
West Columbia SC 29172
803-227-3150

# Chain of Custody/Analysis Request

ARP

COC/Lab Request #: 2015-44

Page 1 of 1

Client Contact:

Lab Agreement # :

Project Number :

Site Name: Los Alamos National Laboratory

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

PJ08106

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-8260B | WSP-LL-8260B-TB | WSP-LL-8270C |
|---|---|---|---|---|---|---|
| CAWR-14-86935 | Oct 6 2014 | 09:40 | W | 2 | | 1 |
| CAWR-14-86912 | Oct 6 2014 | 09:40 | W | | 1 | |
| CAWR-14-86939 | Oct 6 2014 | 10:55 | W | 2 | | 1 |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 2 | 1 | 1 |
| CAWR-14-86875 | Oct 6 2014 | 10:55 | W | 2 | | 1 |
| CAWR-14-86880 | Oct 6 2014 | 10:55 | W | 2 | | 1 |
| CAWR-14-86910 | Oct 6 2014 | 10:55 | W | | 1 | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | Melissa Montoya | 10/7/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| | | | | | |
| Relinquished by: FedEx | Print Name: | Date/Time: 10/8/14 0930 | Received by: [signature] | Print Name: Mariela Monge | Date/Time: 10/8/14 0930 |

T=6.4°

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 15

Page 1 of 1
Replaces Date: 03/07/14
Effective Date: 07/15/14

# Sample Receipt Checklist (SRC)

Client: ADEP Cooler Inspected by/date: MGM / 10/8/14 Lot #: RJ08106

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other

| | | | |
|---|---|---|---|
| Yes ☑ | No ☐ | | 1. Were custody seals present on the cooler? |
| Yes ☑ | No ☐ | NA ☐ | 2. If custody seals were present, were they intact and unbroken? |

Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt:
16.0 / 6.7 °C / / °C / / °C / / °C
Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: #3 IR Gun Correction Factor: 0.7 °C
Method of coolant: ☐ Wet Ice ☑ Blue Ice ☐ Dry Ice ☐ None

| | | | |
|---|---|---|---|
| Yes ☑ | No ☐ | NA ☐ | 3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by (SRC) phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.) |
| Yes ☐ | No ☑ | NA ☐ | 4. Is the commercial courier's packing slip attached to this form? |
| Yes ☑ | No ☐ | | 5. Were proper custody procedures (relinquished/received) followed? |
| Yes ☐ | No ☑ | NA ☐ | 5a Were samples relinquished by client to commercial courier? |
| Yes ☑ | No ☐ | | 6. Were sample IDs listed on the COC? |
| Yes ☑ | No ☐ | | 7. Were sample IDs listed on all sample containers? |
| Yes ☑ | No ☐ | | 8. Was collection date & time listed on the COC? |
| Yes ☑ | No ☐ | | 9. Was collection date & time listed on all sample containers? |
| Yes ☑ | No ☐ | | 10. Did all container label information (ID, date, time) agree with the COC? |
| Yes ☑ | No ☐ | | 11. Were tests to be performed listed on the COC? |
| Yes ☑ | No ☐ | | 12. Did all samples arrive in the proper containers for each test? |
| Yes ☑ | No ☐ | | 13. Did all containers arrive in good condition (unbroken, lids on, etc.)? |
| Yes ☑ | No ☐ | | 14. Was adequate sample volume available? |
| Yes ☑ | No ☐ | | 15. Were all samples received within ½ the holding time or 48 hours, whichever comes first? |
| Yes ☐ | No ☑ | | 16. Were any samples containers missing? |
| Yes ☐ | No ☑ | | 17. Were there any excess samples not listed on COC? |
| Yes ☐ | No ☑ | NA ☐ | 18. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials? |
| Yes ☐ | No ☐ | NA ☑ | 19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2? |
| Yes ☐ | No ☐ | NA ☑ | 20. Were all cyanide and/or sulfide samples received at a pH >12? |
| Yes ☐ | No ☐ | NA ☑ | 21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine? |
| Yes ☐ | No ☐ | NA ☑ | 22. Were collection temperatures documented on the COC for NC samples? |
| Yes ☐ | No ☐ | NA ☑ | 23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS? |
| Yes ☐ | No ☑ | | 24. Was the quote number used taken from the container label? |

**Sample Preservation** (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ ($H_2SO_4$,$HNO_3$,HCl,NaOH) using SR # _____.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L (If #21 is No)

SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____
Sample(s) _____ were not received at a pH of <2 and were adjusted accordingly using SR# _____

Sample labels applied by: MGM Verified by: MGM Date: 10/8/14

Comments:

American Radiation Services - Primary

1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEP

**COC/Lab Request #:** 2015-49



**Client Contact:**

**Lab Agreement # :** 63641-001-10

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-86933 | Sep 30 2014 | 13:30 | W | 1 |
| CAWR-14-86935 | Oct 6 2014 | 09:40 | W | 1 |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 1 |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Marks | 10/8/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WS | ok |
| TIME COLLECTED (HH:MM): | | 1235 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: | Rio Grande at Otowi Bridge | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | PEB | |
| TOP DEPTH: | | | SAMPLE USAGE: | QC | |
| BOTTOM DEPTH: | | | EXCAVATED: | | YES / ~~NO~~ / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | ~~WSP-8011-TB~~ | ~~40 ML SEPTUM GLASS~~ | ~~1~~ | ~~HCL~~ DF 10/6/14 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | Y | NA |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | | |
| | WSP-8290-D/F | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS AT 8/3/14 | 1 | ICE | | |
| | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-CN(T) | 250 ML POLY | 1 | NAOH | Y | NA |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE AT 8/3/14 | | |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | ~~WSP-LL-8260B-TB~~ | ~~40 ML SEPTUM GLASS~~ | ~~1~~ | ~~ICE~~ OF 10/6/14 | | |
| NA | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | Y | NA |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86874

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | Y | NA |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** W. Shaw

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86933

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 09/30/2014 | **FIELD MATRIX:** | WG | ok |
| **TIME COLLECTED (HH:MM):** | | 1313 | **MEDIA:** | UA | |
| **PRS ID:** | | ok | **SAMPLE TECH CODE:** | UA | PP |
| **LOCATION ID:** | Ancho Spring | | **FIELD PREP:** | UF | ok |
| **LOCATION TYPE:** | SPR | | **FIELD QC TYPE:** | REG | |
| **PORT:** | | | **SAMPLE USAGE:** | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

| | | | |
|---|---|---|---|
| **EVENT ID:** | 6888 | **EVENT NAME:** | White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event |
| **SAMPLE ID:** | CAWR-14-86933 | **WORK ORDER:** | NA |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 139 mg/L Flow (in gpm) 4.5 GPM Oxidation-Reduction Potential NA mV

pH 8.39 SU Specific Conductance 139 uS/cm Temperature 21.26 deg C

Turbidity 2.5 NTU

**COLLECTED BY (PRINT)** S. Spane

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** Robert Stocker | **Date/Time** 10/2/14 1320 | **RECEIVED BY (Printed Name) (Signature)** K. Greene | **Date/Time** 10/2/14 1:20 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86935

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/06/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 0940 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | La Mesita Spring | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | SPR | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| ↓ | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | ↓ | ↓ |
| ↓ | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-LL-8270C | 1 LITER AMBER GLASS | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6888

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event

**SAMPLE ID:** CAWR-14-86935

**WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-RAD | 1 GAL POLY | 1 | HNO3 | Y | NA |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.13 mg/L Flow (in gpm) 0.4 GPM Oxidation-Reduction Potential NA mV

pH 7.89 SU Specific Conductance 316 uS/cm Temperature 17.80 deg C

Turbidity 5.1 NTU

**COLLECTED BY (PRINT)** W. Shaw + D. Fellenz

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** Andrew Stocker | **Date/Time** 10/6/14 1305 | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** 10/6/14 1305 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 09/16/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-49

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| ARS1-14-02742 | Generic:Low_Level_Tritium | 1 | | | | |
| ARS1-14-02742 | Generic:Low_Level_Tritium | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-14-02742 | Generic:Low_Level_Tritium | ARS1-B14- | ARS1-B14- | 2 | | | | | 1 | | | | | 1 | 1 | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| Generic:Low_Level_Tritium | RAD | CAWR-14-86874 | ARS1-B14-02562-06 | PEB | 1 | 0 | 0 | 0 |
| Generic:Low_Level_Tritium | RAD | CAWR-14-86933 | ARS1-B14-02562-04 | REG | 1 | 0 | 0 | 0 |
| Generic:Low_Level_Tritium | RAD | CAWR-14-86935 | ARS1-B14-02562-05 | REG | 1 | 0 | 0 | 0 |
| Generic:Low_Level_Tritium | RAD | LCS | ARS1-B14-02562-01 | LCS | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | LCSD | ARS1-B14-02562-02 | LCSD | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | MB | ARS1-B14-02562-03 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02562-01 | ARS1-B14-02562-02 | Generic:Low_Level_Tritium | Tritium | ARS1-B14-02562 | 11-06-2014 | W | 92.000 | 71.000 | 120.00 | 80.000 | | 10 | 25.953 | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

# DATA VALIDATION REPORT

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rio Grande at Otowi Bridge | 2015-49 | CAWR-14-86874 | PEB | INIT | RAD | Generic:Low_Level_Tritiu | Tritium | U | U | R5 | N | -0.5140 | pCi/L | -0.5140 | pCi/L | 2.4410 | 0.7120 | W | 10/06/2014 | | ARS1-B14-02562 | VAL | Y |
| Ancho Spring | 2015-49 | CAWR-14-86933 | REG | INIT | RAD | Generic:Low_Level_Tritiu | Tritium | U | U | R5 | N | -2.2500 | pCi/L | -2.2500 | pCi/L | 2.4740 | 0.7610 | W | 09/30/2014 | | ARS1-B14-02562 | VAL | Y |
| La Mesita Spring | 2015-49 | CAWR-14-86935 | REG | INIT | RAD | Generic:Low_Level_Tritiu | Tritium | U | U | R5 | N | -1.2700 | pCi/L | -1.2700 | pCi/L | 2.3200 | 0.6840 | W | 10/06/2014 | | ARS1-B14-02562 | VAL | Y |

| Reason Code | Description |
|---|---|
| R5 | Analyte is not detected because the amount reported is less than the MDC. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-86874 | Rio Grande at Otowi Bridge | PEB | Generic:Low_Level_Tritium | 0 | 1 |
| CAWR-14-86933 | Ancho Spring | REG | Generic:Low_Level_Tritium | 0 | 1 |
| CAWR-14-86935 | La Mesita Spring | REG | Generic:Low_Level_Tritium | 0 | 1 |

INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Request Number: 2015-49

INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory Request: 2015-49

# Original COC

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-49



**Client Contact:**

**Lab Agreement # :** 63641-001-10

**Project Number :**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-86933 | Sep 30 2014 | 13:30 | W | 1 |
| CAWR-14-86935 | Oct 6 2014 | 09:40 | W | 1 |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martin | 10/8/14 3:08 | J. Holliday | J. Holliday | 10.9.14/0940 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

3 of 3

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory Request: 2015-49

# Case Narrative

ARS INTERNATIONAL

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November 7, 2014

LANL
Keith Greene
PO Box 1663 MS M992
Los Alamos, NM 87545

Request Number: **2015-49**
LANL Sample ID: **CAWR-14-86933; CAWR-14-86935; CAWR-14-86874**

Dear Mr. Greene;

On October 9, 2014, ARS International received three (3) water samples to be analyzed for Low Level Tritium.

Samples were counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The client and QA/QC samples were counted with a count time sufficient to meet quality control parameters for counting equipment and were within acceptance criteria and statistical sound detection limits.

If you have any questions please do not hesitate to call at 225.381.2991 or email LANL@amrad.com.

Sincerely,

Laboratory Management
**ARS International**

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# COVER PAGE

## PROJECT SAMPLE IDENTIFICATION CROSS-REFERENCE TO ARS SAMPLE LABORATORY IDs

Subcontract (LANL Agreement Number) 250953

| Request Number | LANL PROJECT SAMPLE ID NUMBER | American Radiation Services SAMPLE ID NUMBER(S) |
|---|---|---|
| 2015-49 | CAWR-14-86933 | ARS1-14-02742-001 |
| 2015-49 | CAWR-14-86935 | ARS1-14-02742-002 |
| 2015-49 | CAWR-14-86874 | ARS1-14-02742-003 |

**SAMPLE RECEIPT**

The samples were received in good condition. The samples were screened for radioactive contamination as per procedure **ARS-062 "Sample Receiving"**. A 28-day turnaround was requested on the chain of custody.

**ANALYTICAL METHODS**

Tritium analyses were performed using **ARS-040, "Tritium Assay in Water Samples Using Electrolytic Enrichment".**

**ANALYTICAL RESULTS**

The result data that are flagged with "U" indicate that the activity is below the MDC.

**American Radiation Services Project Manager/Laboratory Director's Comments:**

*"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."*

*"I certify that this electronic image and all hardcopies produced from this image accurately represent the data and are in compliance with the LANL specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."*

| James D. Lim | Laboratory Management, ARS International | 11-07-2014 |
|---|---|---|
| **Signature** | **Title** | **Date** |

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# ARS International, LLC

## Laboratory Analysis Report

## ARS1-14-02742

***Prepared for:***

## Los Alamos National Laboratory

**Keith Greene**
**P.O. Box 1663**
**MS M992**
**Los Alamos, NM 87545**
**kgreene@lanl.gov**

**Phone: 505-665-9966**
**Fax: 505-665-9972**

**Project Manager Review**

**Management Review**

Notes: ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

**Contact Person: Questions regarding this analytical report should be addressed to:**

**Project Manager**

**ProjectManagers@amrad.com**

**Phone: 225.381.2991**
**Fax: 225.381.2996**

**LELAP Cert# 01949**

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# Notes:

## Comments:

1.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.

2.0) Data in this report are within the limits of uncertainty specified in the reference method unless otherwise specified.

3.0) Modified analysis procedures are procedures that are modified to meet the certain specifications. An example may be the use of a water method to analyze a solid matrix due to the lack of an officially recognized procedure for the analysis of the solid matrix. Modified analyses are indicated by the subsequent addition of "m" to the procedure number (i.e. 900.0M).

4.0) Derived Air Concentrations and Effluent Release Concentrations are obtained from 10 CFR 20 Appendix B.

5.0) **Total activity** is actually total gamma activity and is determined utilizing the prominent gamma emitters from the naturally occurring radioactive decay chains and other prominent radioactive nuclides. Total activity may be lower than the actual total activity due to the extent of secular equilibrium achieved in the various decay chains at the time of analysis. The total activity is not representative of nuclides that emit solely alpha or beta particles.

6.0) Ra-228 is determined via secular equilibrium with its daughter, Actinium 228 (Gamma Spectroscopy only).

7.0) U-238 is determined via secular equilibrium with its daughter, Thorium 234 (Gamma Spectroscopy only).

8.0) All gamma spectroscopy was performed utilizing high purity germanium detectors (**HPGe**).

9.0) ARS makes every attempt to match sample density to calibrated density; however, in some cases, it is not practical or possible to do so and data results may be affected (Gamma Spectroscopy only).

10.0) Gamma spectroscopy results are calculated values based on the **ORTEC**® GammaVision ENV32 Analysis Engine.

11.0) ACLASS DOD and ISO 17025 certification applies only to the following analytes and methods: Gross Alpha and Gross Beta (EPA 900, SM7110B&C, SW846 9310); Radium 226 (EPA 903, EPA 903.1, SM 7500 Ra-B, SW846 9315); Radium 228 (EPA 904, SM 7500 Ra-B SW846 9320); Iodine-131(EPA 901.1); Uranium by ICPMS (EPA 200.8); Strontium 89/90 (EPA 905, Eichrom SRW01, HASL 300 Sr-03-RC); Tritium (EPA 906, EPA 906M); Gamma Emitters (EPA 901.1, SM7120B, HASL 300 Ga-01-R); Americium-241, Curium 242/244, Plutonium 239/240 and 241, Thorium 228/230/232, Uranium 234/233 and 238 (Eichrom ACW03 VBS); Lead 210 (HASL 300 Pb-01-RC, Eichrom OTW01); Polonium 210 (HASL 300 Po-01-RC, HASL 300 Po-02-RC); Technetium-99 (Eichrom TCW02, Eichrom TCS01M).

## Method References:

1.0) **EPA 600/4-80-032**; Prescribed Procedures for the Measurements of Radioactivity in Drinking Water, August 1980.

2.0) Standard Methods for Examination of Water and Waste Water, 18th, 1992.

3.0) **EPA SW-846**; Test Methods for Evaluating Solid Waste, Third Edition, (9/86). (Updated through 1995).

4.0) **EPA 600/4/79-020**; Methods for Chemical Analysis of Water and Waste, March 1983.

5.0) **HASL 300**

6.0) **ARS-040**; An LCSD is not reported with this process. The criteria for the LCS/LCSD analysis for reproducibility have not been established for Low Level Tritium analysis. A prepared standard for Low Level Tritium has not been developed. As a result, the standard we use is based on the dilution of a verified conventional tritium standard. The volume required for Low Level Tritium analysis, in addition to the lack of an available Low Level Tritium standard, introduce variability into the LCS/LCSD analysis that does not represent the actual sample analysis. The preferred measure for reproducibility is to run a duplicate analysis of a sample.

## Definitions:

| | | |
|---|---|---|
| 1.0) | **ND** | Not detected above the detection limit (non-detect). |
| 2.0) | **MDC** | (Minimum Detectable Concentration) minimum concentration of the analyte that ARS can detect utilizing the specific analysis |
| 3.0) | **MBL** | Method Blank |
| 4.0) | **DO** | Duplicate Original |
| 5.0) | **DUP** | Method Duplicate |
| 6.0) | **MS/MSD** | Matrix Spike/Matrix Spike Duplicate |
| 7.0) | **S** | Spike |
| 8.0) | **RS** | Reference Spike |
| 9.0) | ***SC** | Subcontracted out to another qualified laboratory |
| 10.0) | **NR** | Not Referenced |
| 11.0) | **N/A** | Not Applicable |
| 13.0) | **U** | Activity is below the MDC |
| 14.0) | **LCS/LCSD** | Laboratory Control Standard/Laboratory Control Standard Duplicate |
| 15.0) | **DLC** | Decision Level Concentration (ANSI N42.23) or critical level |

Notes: ARS International assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

***LELAP Cert# 01949*** ***NELAP Cert# E87558***

*ARS-059-010*
*Revision: 3*
*Revision Date: 100314*

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

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| | | | |
|---|---|---|---|
| **ARS Sample Delivery Group:** | ARS1-14-02742 | **Request or PO Number:** | 2015-49 |
| **Client Sample ID:** | CAWR-14-86933 | **ARS Sample ID:** | ARS1-14-02742-001 |
| **Sample Collection Date:** | 09/30/14 | **Date Received:** | 10/09/14 |
| **Sample Matrix:** | Aqueous | **Report Date:** | 11/07/14 |

| Analysis Description | Analysis Results | CSU +/- 1 s | MDC | DLC | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|---|---|---|---|---|---|---|---|---|---|---|
| Enriched H-3 | -2.250 | 0.761 | 2.474 | 1.198 | U | pCi/L | ARS-040 | 11/06/14 16:42 | JPB | NA |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**NOTES: Analytical Contract 250953**

Project Manager Review

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| | | | |
|---|---|---|---|
| **ARS Sample Delivery Group:** | ARS1-14-02742 | **Request or PO Number:** | 2015-49 |
| **Client Sample ID:** | CAWR-14-86935 | **ARS Sample ID:** | ARS1-14-02742-002 |
| **Sample Collection Date:** | 10/06/14 | **Date Received:** | 10/09/14 |
| **Sample Matrix:** | Aqueous | **Report Date:** | 11/07/14 |

| Analysis Description | Analysis Results | CSU +/- 1 s | MDC | DLC | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|---|---|---|---|---|---|---|---|---|---|---|
| Enriched H-3 | -1.270 | 0.684 | 2.320 | 1.123 | U | pCi/L | ARS-040 | 11/06/14 20:53 | JPB | NA |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**NOTES: Analytical Contract 250953**

Project Manager Review

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| | | | |
|---|---|---|---|
| **ARS Sample Delivery Group:** | ARS1-14-02742 | **Request or PO Number:** | 2015-49 |
| **Client Sample ID:** | CAWR-14-86874 | **ARS Sample ID:** | ARS1-14-02742-003 |
| **Sample Collection Date:** | 10/06/14 | **Date Received:** | 10/09/14 |
| **Sample Matrix:** | Aqueous | **Report Date:** | 11/07/14 |

| Analysis Description | Analysis Results | CSU +/- 1 s | MDC | DLC | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|---|---|---|---|---|---|---|---|---|---|---|
| Enriched H-3 | -0.514 | 0.712 | 2.441 | 1.182 | U | pCi/L | ARS-040 | 11/07/14 01:04 | JPB | NA |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**NOTES: Analytical Contract 250953**

Project Manager Review

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# QC Results Report

**Sample Delivery Group:** ARS1-14-02742
**Date Received:** 10/9/2014

## Laboratory Control Sample Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Percent Recovery (%) | LCS Acceptance Range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02562 | LCS | H3 | 22.209 | 3.517 | 2.611 | 24.010 | | pCi/L | ARS-040 | 11/6/14 2:08 | JPB | 92 | 80%-120% |

## Blank Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02562 | MBL | H3 | -0.216 | 0.706 | 2.410 | NA | U | pCi/L | ARS-040 | 11/6/14 2:08 | JPB |

## Sample RER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | RER | RER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02562 | LCSD | H3 | 22.209 | 3.517 | 17.107 | 2.770 | | pCi/L | ARS-040 | 11/6/14 2:08 | JPB | 0.81 | < 1 |

## Sample DER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | DER | DER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02562 | LCSD | H3 | 22.209 | 3.517 | 17.107 | 2.770 | | pCi/L | ARS-040 | 11/6/14 2:08 | JPB | 2.28 | < 3 |

Project Manager Review

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LELAP Certificate# 01949 NELAP Certificate # E87558

# QC Evaluation

**EPA Method: ARS-040**
**Batch ID: ARS1-B14-02562**
**SDG's: ARS1-14-02742**

| | | | |
|---|---|---|---|
| **LCS** | 22.2090 | **CSU (2s)** | 6.8930 |
| **LCSD** | 17.1070 | **CSU-D (2s)** | 5.4290 |

**DER =** abs(LSC-LSCD) / sqr((2s CSU/2)^2)+(( 2s CSU-D/2)^2) *at 1 sigma* = **< 3**

**DER** 5.102 / 4.387126 = 1.162948 **< 3**

**% RPD=** ABS( LCS - LSCD) / (LCS+LCSD)/2 * 100 = **< 25%**

**%RPD** 5.102 / 19.658 *100 = 25.95381 **< 25%**

The *RPD* shall be less than 25% or other client-applied criteria

**RER=** abs((LCS-LCSD)) / (CSU)+(CSD) *at 2 sigma* = **<1** ***<--LANL Requirement***

**RER =** 5.102 / 12.3220 0.41405616 **<1**

**Blank Information**

| | Act | CSU(2s) | MDA | Act>MDA |
|---|---|---|---|---|
| **AM-241** | | | | |
| **U-234** | | | | |
| **U-235** | | | | |
| **U-238** | | | | |
| **Pu-238** | | | | |
| **Pu-239/240** | | | | |
| **Th-228** | | | | |
| **Th-230** | | | | |
| **Th-232** | | | | |
| **H3** | -0.216 | 1.383 | 2.41 | |
| **Ra-226** | | | | |
| **Ra-228** | | | | |
| **Total U** | | | | |
| **Pb-210** | | | | |
| **Po-209** | | | | |
| **Sr-90** | | | | |
| **TC-99** | | | | |
| **NI-63** | | | | |

*MDA should be below RDL
*Blank activity must be below MDA
*Blank activity must be < 1.65*CSU (DOE only)

ACT = -0.216
CSU = 1.383
Is ACT<1.65*CSU? YES

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-02562**

| **Method** | **ARS-040** | **Analysis** | **LSC-A-022** | **Matrix** | **AQ** |
|---|---|---|---|---|---|
| **Description** | **Low Level Tritium by Electrolytic Enrichment** | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02562-01 | LCS | B-17653 | | | | | | | | |
| ARS1-B14-02562-02 | LCSD | B-17654 | | | | | | | | |
| ARS1-B14-02562-03 | MBL | | | | | | | | | |
| ARS1-B14-02562-04 | TRG | | | | **ARS1-14-02742** | 001 | 1 | CAWR-14-86933 | STD | 11/03/14 |
| ARS1-B14-02562-05 | TRG | | | | **ARS1-14-02742** | 002 | 1 | CAWR-14-86935 | STD | 11/03/14 |
| ARS1-B14-02562-06 | TRG | | | | **ARS1-14-02742** | 003 | 1 | CAWR-14-86874 | STD | 11/03/14 |

American Radiation Services
Baton Rouge Laboratory

# LCS Report
## Analytical Batch: ARS1-B14-02562



| BlindID | ABatch | ABatchSampleID | BlindGroup | StdID | Isotope | ExpectedAddition | ExpectedValue | EmptyWt | GrossWt | NetWt | UserID | ModDate | ExpectedValue_CT | MidPointCountDate | KnownValue |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-17653 | ARS1-B14-02562 | ARS1-B14-02562-01 | B-H3 | S-0289 | H-3 | 5 | 2.406976091 | 13.2701 | 18.3127 | 5.0426 | AMRAD\BSTEFFENS | 10/17/2014 | 2.399572113 | 11/6/2014 | 12.10008234 |
| B-17654 | ARS1-B14-02562 | ARS1-B14-02562-02 | B-H3 | S-0289 | H-3 | 5 | 2.406976091 | 13.0957 | 18.1169 | 5.0212 | AMRAD\BSTEFFENS | 10/17/2014 | 2.399572113 | 11/6/2014 | 12.0487315 |

# ARS-040



| ID_31001_040 | ABatch | AnalysisCode | ABatchSampleID | ClientID | IC_ID | S01_1_EnrichCellNo |
|---|---|---|---|---|---|---|
| 1243 | ARS1-B14-02562 | LSC-A-022 | ARS1-B14-02562-01 | | | 0 |
| 1244 | ARS1-B14-02562 | LSC-A-022 | ARS1-B14-02562-02 | | | 0 |
| 1245 | ARS1-B14-02562 | LSC-A-022 | ARS1-B14-02562-03 | | | 0 |
| 1246 | ARS1-B14-02562 | LSC-A-022 | ARS1-B14-02562-04 | CAWR-14-86933 | | 0 |
| 1247 | ARS1-B14-02562 | LSC-A-022 | ARS1-B14-02562-05 | CAWR-14-86935 | | 0 |
| 1248 | ARS1-B14-02562 | LSC-A-022 | ARS1-B14-02562-06 | CAWR-14-86874 | | 0 |

| S01_2_TareCell | S01_3_TareResv | S02_GrossWtResv | S03_1_WtNa2O2 | C_GrossSampleAdded | S04_1_ElectrolSD |
|---|---|---|---|---|---|
| 332.34 | 214.98 | 718.9 | 2.09 | 503.92 | 10/19/2014 18:45:00 |
| 321.66 | 263.73 | 763.76 | 2.09 | 500.03 | 10/19/2014 18:45:00 |
| 320.96 | 218.6 | 720.27 | 2.01 | 501.67 | 10/19/2014 18:45:00 |
| 340.05 | 192.63 | 692.8 | 2.07 | 500.17 | 10/19/2014 18:45:00 |
| 322.62 | 209.36 | 710.2 | 2.01 | 500.84 | 10/19/2014 18:45:00 |
| 321.86 | 204.67 | 704.78 | 2.06 | 500.11 | 10/19/2014 18:45:00 |

| S04_2_StartAmp | S04_3_StartBathC | S05_1_ElectrolED | S05_2_EndBathC | S05_3_EndCellWt | C_GrossSmplRec |
|---|---|---|---|---|---|
| 5 | 2 | 11/04/2014 11:53:00 | 2 | 561.86 | 14.54 |
| 5 | 2 | 10/04/2014 11:45:00 | 2 | 601.26 | 15.87 |
| 5 | 2 | 11/05/2014 12:45:00 | 2 | 555.64 | 16.08 |
| 5 | 2 | 11/04/2014 08:34:00 | 2 | 549.35 | 16.67 |
| 5 | 2 | 11/05/2014 10:58:00 | 2 | 547.34 | 15.36 |
| 5 | 2 | 11/05/2014 12:45:00 | 2 | 542.84 | 16.31 |

| C_EnrichmentF | S06_TareWt | S07_GrossWt | C_RecoveredWa | S08_TearWtLSCVial | S09_VialPlusSmpl | C_NetSample |
|---|---|---|---|---|---|---|
| 34.65749656 | 110.5 | 119.65 | 9.15 | 6.5 | 15.45 | 8.95 |
| 31.5078765 | 114.56 | 126.73 | 12.17 | 6.51 | 16.55 | 10.04 |
| 31.19838308 | 111.12 | 122.51 | 11.39 | 6.52 | 16.52 | 10 |
| 30.00419916 | 108.04 | 120.16 | 12.12 | 6.58 | 16.6 | 10.02 |
| 32.60677083 | 96.77 | 107.82 | 11.05 | 6.54 | 16.54 | 10 |
| 30.66278357 | 104.4 | 116.5 | 12.1 | 6.42 | 16.43 | 10.01 |

| S10_1_WtVislSmplDrWatFill | C_NetDeadWaterAdded | C_TareWtBFCocktail | S10_2_GrossWtVSC | C_NetWtCocktailAdded |
|---|---|---|---|---|
| 16.56 | 1.11 | 16.56 | 26.8 | 10.24 |
| 16.55 | 0 | 16.55 | 26.79 | 10.24 |
| 16.52 | 0 | 16.52 | 26.77 | 10.25 |
| 16.61 | 0.01 | 16.61 | 26.83 | 10.22 |
| 16.55 | 0.01 | 16.55 | 26.81 | 10.26 |
| 16.43 | 0 | 16.43 | 26.65 | 10.22 |

| UserID | ModDate |
|---|---|
| AMRAD\JBYRD | 11/04/2014 14:55:49 |
| AMRAD\JBYRD | 11/04/2014 15:00:39 |
| AMRAD\JBYRD | 11/05/2014 17:07:19 |
| AMRAD\JBYRD | 11/04/2014 15:04:55 |
| AMRAD\JBYRD | 11/05/2014 17:12:49 |
| AMRAD\JBYRD | 11/05/2014 17:16:17 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141105_2148
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141105_2148\20141105_2148.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141105_2148\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141105_2148\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 240.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

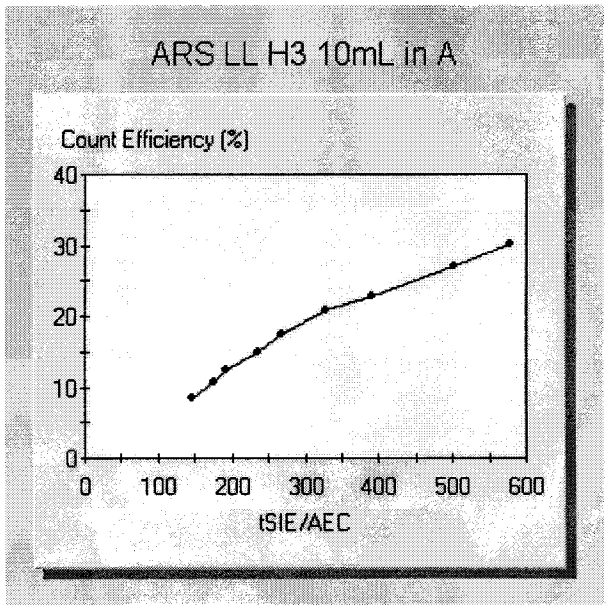
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | BACKGROUND | 1.319 | 5.68 | 397.32 | 23.21 | 240.00 | 11/5/2014 | 9:57:14 PM | |
| 2 | 2 | B14-02562-01 | 4.349 | 18.04 | 421.75 | 24.10 | 240.00 | 11/6/2014 | 2:08:11 AM | |
| 2 | 3 | B14-02562-02 | 3.687 | 15.22 | 424.95 | 24.22 | 240.00 | 11/6/2014 | 6:19:28 AM | |
| 2 | 4 | B14-02562-03 | 1.287 | 5.40 | 413.86 | 23.82 | 240.00 | 11/6/2014 | 10:30:31 AM | |
| 2 | 5 | B14-02562-04 | 0.995 | 4.11 | 424.44 | 24.20 | 240.00 | 11/6/2014 | 2:41:31 PM | |
| 2 | 6 | B14-02562-05 | 1.124 | 4.75 | 409.99 | 23.67 | 240.00 | 11/6/2014 | 6:52:33 PM | |
| 2 | 7 | B14-02562-06 | 1.244 | 5.19 | 417.98 | 23.97 | 240.00 | 11/6/2014 | 11:03:32 PM | |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-02562 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Initial_Mass_sample_g | Mass_Na2O2_added_g | Final_mass_electrolyzed_sample_NaOH_g | Mass_equivalent_NaOH_g | Final_Mass_Electrolyzed_sample_g | VolumeFactor_X | Enrichment_Factor_Y |
|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02562-01 | 503.920 | 2.090 | 14.540 | 2.144 | 12.396 | 0.025 | 31.599 |
| LSC-A-022 | ARS1-B14-02562-02 | 500.030 | 2.090 | 15.870 | 2.144 | 13.726 | 0.027 | 28.438 |
| LSC-A-022 | AR51-B14-02562-03 | 501.670 | 2.010 | 16.080 | 2.062 | 14.018 | 0.028 | 27.956 |
| LSC-A-022 | ARS1-B14-02562-04 | 500.170 | 2.070 | 16.670 | 2.124 | 14.546 | 0.029 | 26.902 |
| LSC-A-022 | ARS1-B14-02562-05 | 500.840 | 2.010 | 15.360 | 2.062 | 13.298 | 0.027 | 29.363 |
| LSC-A-022 | ARS1-B14-02562-06 | 500.110 | 2.060 | 16.310 | 2.114 | 14.196 | 0.028 | 27.535 |
| | | | | | | | | |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-02562 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Average_Sample_CPM | Bkg_CPM | tSIE | Detector_Eff_decimal | Aliquot | AliqUnits | Activity_reference_date | Start_Date_of_Count | Sample_Count_Duration_min |
|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02562-01 | 4.349 | 1.319 | 421.750 | 0.241 | 0.00895 | L | 1/3/2013 | 11/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02562-02 | 3.687 | 1.319 | 424.950 | 0.242 | 0.01004 | L | 1/3/2013 | 11/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02562-03 | 1.287 | 1.319 | 413.860 | 0.238 | 0.01000 | L | 11/5/2014 | 11/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02562-04 | 0.995 | 1.319 | 424.440 | 0.242 | 0.01002 | L | 9/30/2014 | 11/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02562-05 | 1.124 | 1.319 | 409.990 | 0.237 | 0.01000 | L | 10/6/2014 | 11/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02562-06 | 1.244 | 1.319 | 417.980 | 0.240 | 0.01001 | L | 10/6/2014 | 11/6/2014 | 240.000 |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-02562 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Total_Bkg_Count_Duration_min | DF | Sample_Activity_Conc | Standard_Counting_Uncertainty | CU_1 | CSU_1 | CU_1_96 | CSU_1_96 | MDC | DLC | ActivityReportUnits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02562-01 | 240.000 | 0.90167 | 22.209 | 1.126 | 1.126 | 3.517 | 2.208 | 6.893 | 2.611 | 1.264 | pCi |
| LSC-A-022 | ARS1-B14-02562-02 | 240.000 | 0.90167 | 17.107 | 1.043 | 1.043 | 2.770 | 2.045 | 5.429 | 2.573 | 1.246 | pCi |
| LSC-A-022 | ARS1-B14-02562-03 | 240.000 | 0.99985 | -0.216 | 0.705 | 0.705 | 0.706 | 1.382 | 1.383 | 2.410 | 1.167 | pCi |
| LSC-A-022 | ARS1-B14-02562-04 | 240.000 | 0.99432 | -2.250 | 0.682 | 0.682 | 0.761 | 1.337 | 1.491 | 2.474 | 1.198 | pCi |
| LSC-A-022 | ARS1-B14-02562-05 | 240.000 | 0.99524 | -1.270 | 0.657 | 0.657 | 0.684 | 1.288 | 1.341 | 2.320 | 1.123 | pCi |
| LSC-A-022 | ARS1-B14-02562-06 | 240.000 | 0.99508 | -0.514 | 0.708 | 0.708 | 0.712 | 1.388 | 1.396 | 2.441 | 1.182 | pCi |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-02562 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | AliquotReportUnits | UserID | ModDate |
|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02562-01 | L | AMRAD\JBYRD | 11/7/2014 |
| LSC-A-022 | ARS1-B14-02562-02 | L | AMRAD\JBYRD | 11/7/2014 |
| LSC-A-022 | ARS1-B14-02562-03 | L | AMRAD\JBYRD | 11/7/2014 |
| LSC-A-022 | ARS1-B14-02562-04 | L | AMRAD\JBYRD | 11/7/2014 |
| LSC-A-022 | ARS1-B14-02562-05 | L | AMRAD\JBYRD | 11/7/2014 |
| LSC-A-022 | ARS1-B14-02562-06 | L | AMRAD\JBYRD | 11/7/2014 |
| | | | | |

**ARS Batch Number:** ARS1-B14 - 02562

| Enter these Values for LCS | | | |
|---|---|---|---|
| | Current ACT | 5.3270 | Standards Report |
| | NetWt | 5.0426 | LCS Report |
| | Aliquot | 0.5039 | Procedural Data Report |

| Enter these Values for LCSD | | | |
|---|---|---|---|
| | Current ACT | 5.3270 | Standards Report |
| | NetWt | 5.0212 | LCS Report |
| | Aliquot | 0.5000 | Procedural Data Report |

## Expected Value Calculations

**ARS Batch Number:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **LCS** | **CALCULATED EXPECTED VALUE** | = | 24.0117 | | | |
| | | | **Range** | 18.0088 | - | 30.0146 |
| **LCSD** | **CALCULATED EXPECTED VALUE** | = | 24.0958 | | | |
| | | | **Range** | 18.0718 | - | 30.1197 |

# Standards Activity as of: 11/06/14 02:08

| Active | Std ID | Isotope | PSCLT | Verification Date | Exp Date | Status | Ref Date | Ref ACT (dpm) | ACT at Date Above (dpm/g) | Halflife (days) | Parent ID | Expended Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | **S-0289** | H-3 | **SL** | 01/07/14 | 01/07/15 | OK | 01/03/13 | 5.9080E+00 | **5.3271** | 4.500E+03 | **S-0237** | |

# Beta Liquid Scintillation Counter Log Book

| | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 4 | 1732 | SNC 16 | QA | QA | [illegible] |
| | 16:40 | SNC 16 | QA | QA | [illegible] |
| | ↓ | Background | B14-02771 | 1824 | [illegible] |
| | ↓ | B14-02771-04 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -05 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -06 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -07 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -08 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -09 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -10 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -11 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -12 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -13 | ↓ | ↓ | [illegible] |
| | ↓ | ↓ -14 | ↓ | ↓ | [illegible] |
| 11-5-14 ~~4.12~~ | 14:12 | SNC 16 | QA | QA | [illegible] |
| ↓ | ↓ | Background | B14-02771 | 1547 | [illegible] |
| ↓ | ↓ | B14-02771-12 | ↓ | ↓ | [illegible] |
| 11-5-14 | 17:18 | SNC 16 | QA | QA | [illegible] |
| ↓ | ↓ | Background | B14-02562 | 2148 | [illegible] |
| ↓ | ↓ | B14-02562-01 | ↓ | ↓ | [illegible] |



Reviewed By: [illegible] Date: 11-7-14
Initials

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technic Initials |
|---|---|---|---|---|---|
| 11-5-14 | 17:18 | B14-02562-02 | B14-02562 | 2148 | JB |
| ↓ | ↓ | ↓ -03 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -04 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | JB |
| | | | | | |
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Reviewed By: [signature] Date: 11-7-1
Initials

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

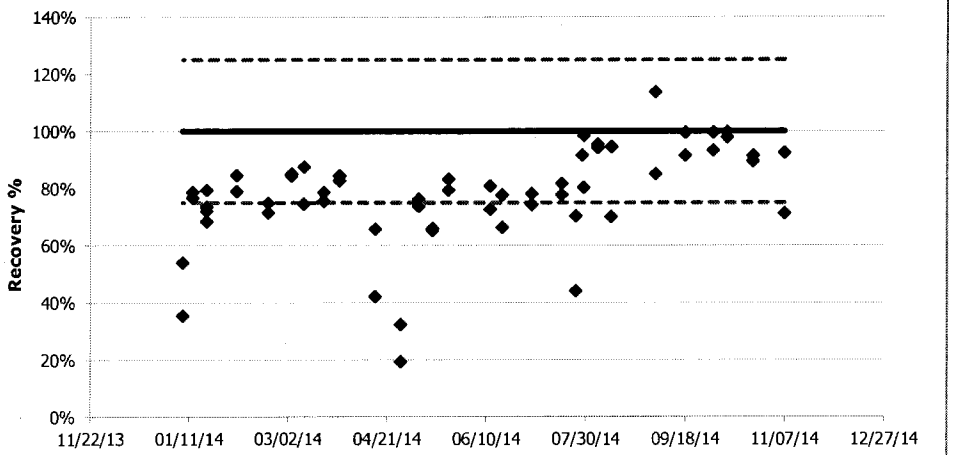
# Control Charts

American Radiation Services
Baton Rouge Laboratory

# QC Chart

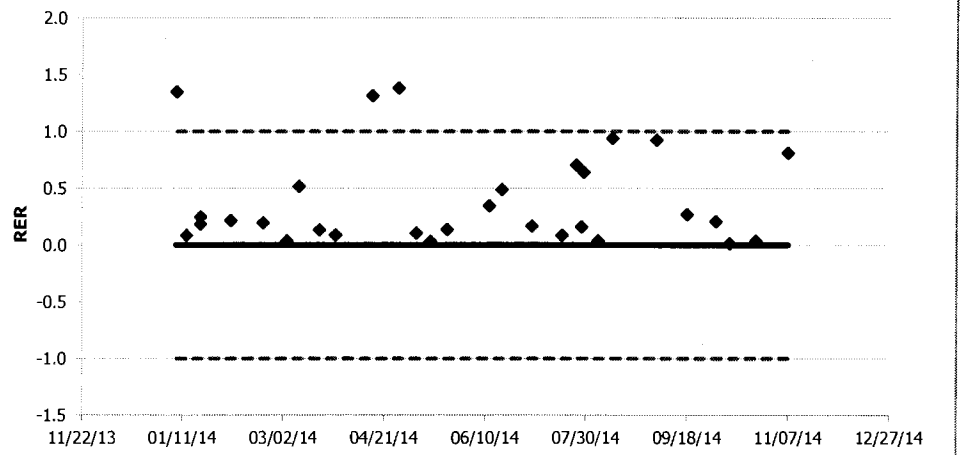


## LLH-3 LCS



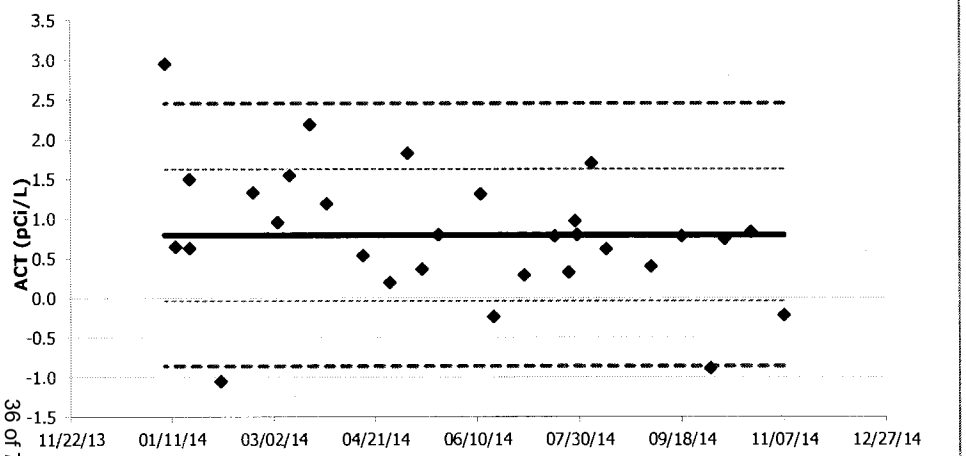

| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.7785 | 0.1717 | 30 | 1.2500 | 0.7500 |

## LLH-3 RER



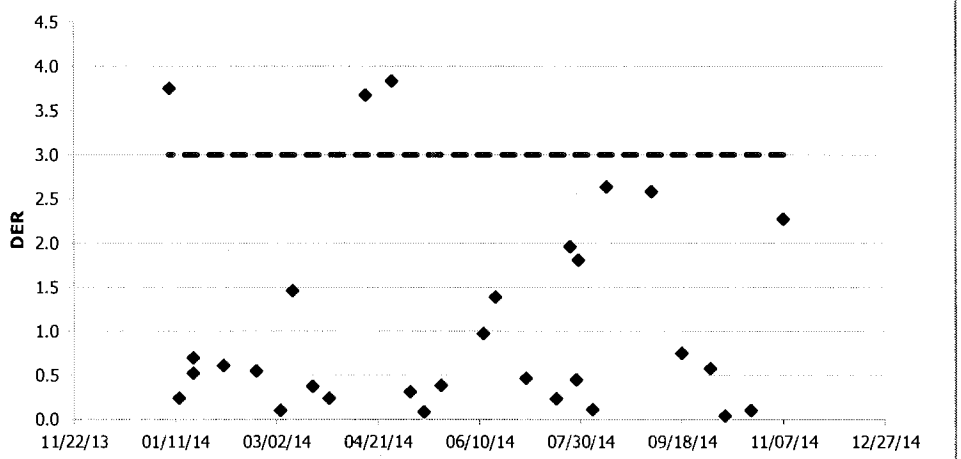

| | | n | UCL | LCL |
|---|---|---|---|---|
| | | 30 | 1.0000 | -1.0000 |

## LLH-3 Blank




| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.7937 | 0.8283 | 30 | 2.4503 | -0.8628 |

## LLH-3 DER

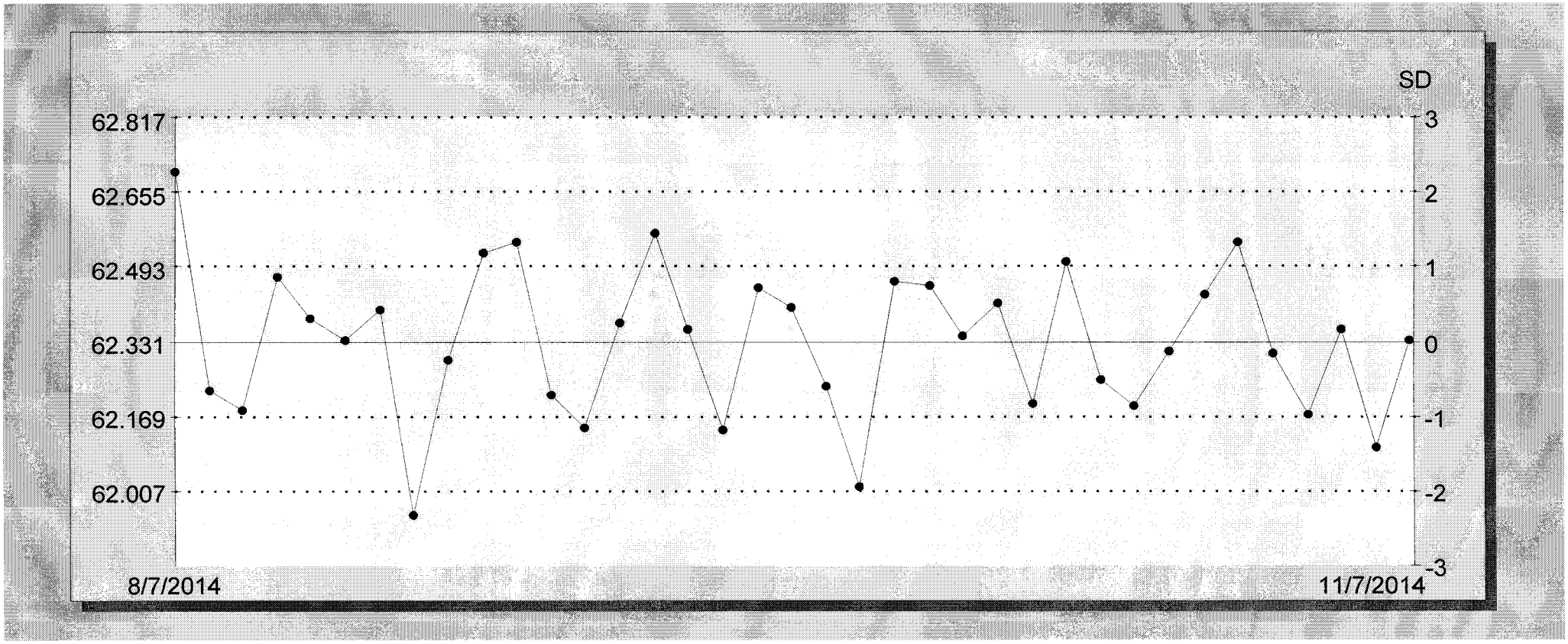



| | | n | UCL | |
|---|---|---|---|---|
| | | 30 | 3.0000 | |

3H Efficiency
Total # pts : 5938
Valid # pts : 37
Mean : 62.33
SD : 0.16

| Date | Value | Valid Pt |
|---|---|---|
| Aug 07, 2014 | 62.70 | X |
| Aug 08, 2014 | 62.22 | X |
| Aug 11, 2014 | 62.18 | X |
| Aug 14, 2014 | 62.47 | X |
| Aug 15, 2014 | 62.38 | X |
| Aug 19, 2014 | 62.33 | X |
| Aug 20, 2014 | 62.40 | X |
| Aug 22, 2014 | 61.95 | X |
| Aug 29, 2014 | 62.29 | X |
| Sep 04, 2014 | 62.53 | X |
| Sep 05, 2014 | 62.55 | X |
| Sep 08, 2014 | 62.22 | X |
| Sep 12, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.37 | X |
| Sep 14, 2014 | 62.57 | X |
| Sep 14, 2014 | 62.36 | X |
| Sep 14, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.45 | X |
| Sep 17, 2014 | 62.41 | X |
| Sep 18, 2014 | 62.23 | X |
| Sep 26, 2014 | 62.02 | X |
| Sep 28, 2014 | 62.46 | X |
| Oct 01, 2014 | 62.45 | X |
| Oct 02, 2014 | 62.34 | X |
| Oct 05, 2014 | 62.42 | X |
| Oct 07, 2014 | 62.20 | X |
| Oct 13, 2014 | 62.50 | X |
| Oct 21, 2014 | 62.25 | X |
| Oct 24, 2014 | 62.19 | X |
| Oct 27, 2014 | 62.31 | X |
| Oct 28, 2014 | 62.43 | X |
| Oct 29, 2014 | 62.55 | X |
| Oct 29, 2014 | 62.30 | X |
| Nov 03, 2014 | 62.17 | X |
| Nov 05, 2014 | 62.36 | X |
| Nov 05, 2014 | 62.10 | X |
| Nov 07, 2014 | 62.34 | X |

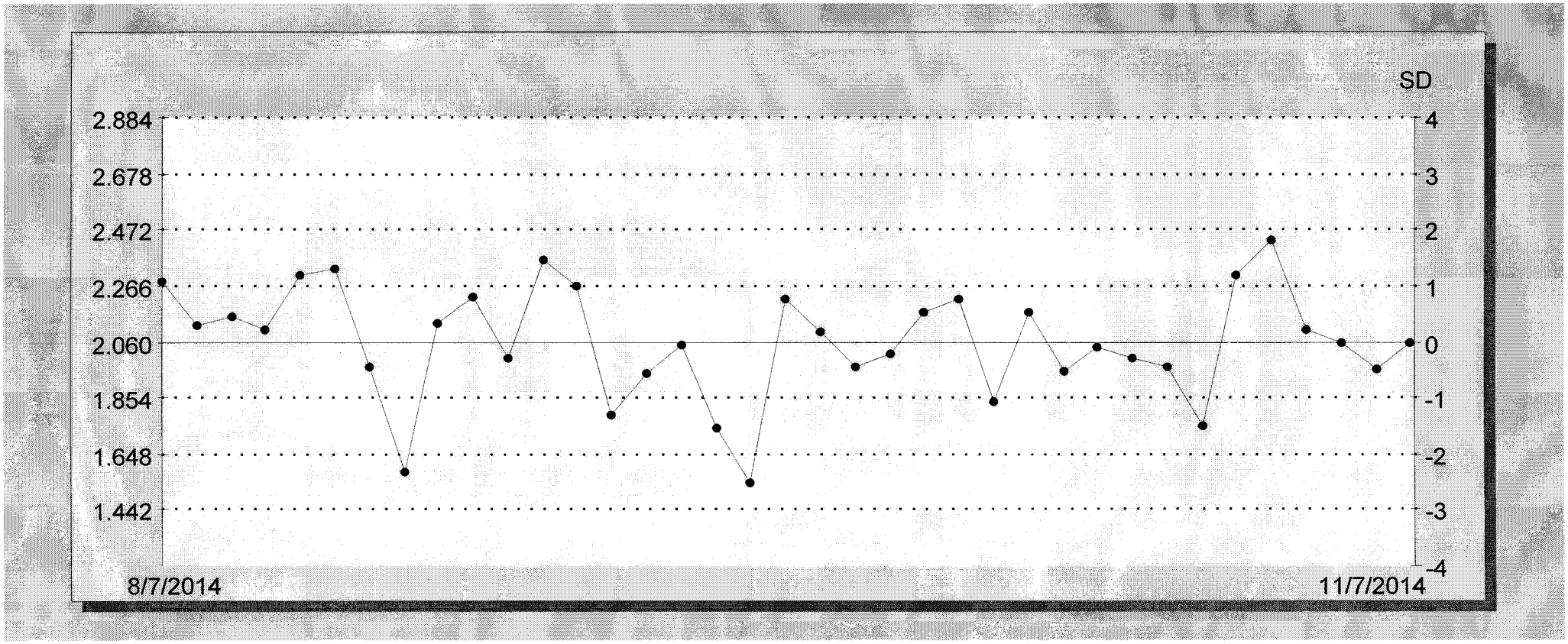
3H Efficiency
Total # pts : 5938
Valid # pts : 37
Mean : 62.33
SD : 0.16



3H Background
Total # pts : 5863
Valid # pts : 37
Mean : 2.06
SD : 0.21

| Date | Value | Valid Pt |
|---|---|---|
| Aug 07, 2014 | 2.29 | X |
| Aug 08, 2014 | 2.12 | X |
| Aug 11, 2014 | 2.15 | X |
| Aug 14, 2014 | 2.11 | X |
| Aug 15, 2014 | 2.31 | X |
| Aug 19, 2014 | 2.33 | X |
| Aug 20, 2014 | 1.97 | X |
| Aug 22, 2014 | 1.58 | X |
| Aug 29, 2014 | 2.13 | X |
| Sep 04, 2014 | 2.22 | X |
| Sep 05, 2014 | 2.00 | X |
| Sep 08, 2014 | 2.36 | X |
| Sep 12, 2014 | 2.26 | X |
| Sep 14, 2014 | 1.79 | X |
| Sep 14, 2014 | 1.95 | X |
| Sep 14, 2014 | 2.05 | X |
| Sep 14, 2014 | 1.74 | X |
| Sep 14, 2014 | 1.54 | X |
| Sep 17, 2014 | 2.21 | X |
| Sep 18, 2014 | 2.10 | X |
| Sep 26, 2014 | 1.97 | X |
| Sep 28, 2014 | 2.01 | X |
| Oct 01, 2014 | 2.17 | X |
| Oct 02, 2014 | 2.22 | X |
| Oct 05, 2014 | 1.84 | X |
| Oct 07, 2014 | 2.17 | X |
| Oct 13, 2014 | 1.95 | X |
| Oct 21, 2014 | 2.04 | X |
| Oct 24, 2014 | 2.00 | X |
| Oct 27, 2014 | 1.97 | X |
| Oct 28, 2014 | 1.75 | X |
| Oct 29, 2014 | 2.30 | X |
| Oct 29, 2014 | 2.43 | X |
| Nov 03, 2014 | 2.11 | X |
| Nov 05, 2014 | 2.06 | X |
| Nov 05, 2014 | 1.96 | X |
| Nov 07, 2014 | 2.06 | X |

3H Background
Total # pts : 5863
Valid # pts : 37
Mean : 2.06
SD : 0.21



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# American Radiation Services Analytical Reports

## for

## Los Alamos National Laboratory

# Tritium- Screening by Low Level Liquid Scintillation Counting

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting Samples

***Procedures:*** **ARS-060** **ARS-040** *Section 14.1 Tritium Screen in Clean Water without Distillation*

***ARS File ID Numbers:*** ARS1-14-02742
***ARS Batch ID:*** ARS1-B14-02479

| | Sample ID: | COUNT TIME | CPMA | Background CPMA | Eff Nucl In A | Aliquot (grams) | ACTIVITY | units | MDA | Sample Must be analyzed as LSC-A-001 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | B14-02479-04 | 120 | 1.428 | 1.167 | 24.06 | 10.00 | 48.864 | pCi/L | 109.6007 | NO |
| 2 | B14-02479-05 | 120 | 1.198 | 1.167 | 23.99 | 10.00 | 5.821 | pCi/L | 109.9205 | NO |
| 3 | B14-02479-06 | 120 | 1.311 | 1.167 | 24.26 | 10.02 | 26.684 | pCi/L | 108.4801 | NO |
| 4 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 5 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 6 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 7 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 8 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 9 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 10 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 11 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 12 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 13 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 14 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 15 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 16 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 17 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 18 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 19 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 20 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 21 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 22 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 23 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-02479**

| Method | ARS-054 | Analysis | LSC-A-021 | Matrix | AQ |
|---|---|---|---|---|---|
| Description | Low Level Tritium Screening | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02479-01 | LCS | | | | | | | | | |
| ARS1-B14-02479-02 | LCSD | | | | | | | | | |
| ARS1-B14-02479-03 | MBL | | | | | | | | | |
| ARS1-B14-02479-04 | TRG | | | | **ARS1-14-02742** | 001 | 1 | CAWR-14-86933 | STD | 11/03/14 |
| ARS1-B14-02479-05 | TRG | | | | **ARS1-14-02742** | 002 | 1 | CAWR-14-86935 | STD | 11/03/14 |
| ARS1-B14-02479-06 | TRG | | | | **ARS1-14-02742** | 003 | 1 | CAWR-14-86874 | STD | 11/03/14 |

# ARS-054



| ID_31001_054 | ABatch | ABatchSampleID | ClientID | Aliquot1 | AliquotUnits1 | IC_ID1 | Aliquot2 | AliquotUnits2 | IC_ID2 | UserID | ModDate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14127 | ARS1-B14-02479 | ARS1-B14-02479-01 | | 1 | L | | | | | AMRAD\JBYRD | 10/13/2014 15:26:15 |
| 14128 | ARS1-B14-02479 | ARS1-B14-02479-02 | | 1 | L | | | | | AMRAD\JBYRD | 10/13/2014 15:26:15 |
| 14129 | ARS1-B14-02479 | ARS1-B14-02479-03 | | 1 | L | | | | | AMRAD\JBYRD | 10/13/2014 15:26:15 |
| 14130 | ARS1-B14-02479 | ARS1-B14-02479-04 | CAWR-14-86933 | 10 | L | 177172 | | | | AMRAD\JBYRD | 10/13/2014 15:26:15 |
| 14131 | ARS1-B14-02479 | ARS1-B14-02479-05 | CAWR-14-86935 | 10 | L | 177176 | | | | AMRAD\JBYRD | 10/13/2014 15:26:15 |
| 14132 | ARS1-B14-02479 | ARS1-B14-02479-06 | CAWR-14-86874 | 10.02 | L | 177179 | | | | AMRAD\JBYRD | 10/13/2014 15:26:16 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141013_1706
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141013_1706\20141013_1706.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141013_1706\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141013_1706\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 120.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

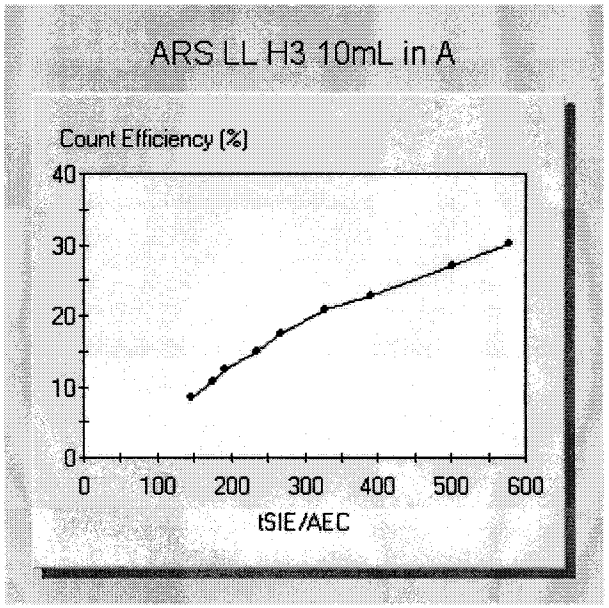
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

Protocol# 10 - Low Level H3_3.lsa User: H3 Low Level

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 1 | BACKGROUND | 1.167 | 5.15 | 381.80 | 22.66 | 120.00 | 10/13/2014 | 5:15:30 PM | |
| 10 | 2 | B14-02479-04 | 1.428 | 5.93 | 420.62 | 24.06 | 120.00 | 10/13/2014 | 7:25:22 PM | |
| 10 | 3 | B14-02479-05 | 1.198 | 4.99 | 418.69 | 23.99 | 120.00 | 10/13/2014 | 9:35:14 PM | |
| 10 | 4 | B14-02479-06 | 1.311 | 5.40 | 425.97 | 24.26 | 120.00 | 10/13/2014 | 11:45:04 PM | |

## *Low Level Tritium pH Checks*

| SDG# | Fraction | pH | Date | Analyst |
|---|---|---|---|---|
| ARS1-14-02742 | 001 | 7 | 10-13-14 | [illegible] |
| ↓ | 002 | 7 | ↓ | [illegible] |
| ↓ | 003 | 7 | ↓ | [illegible] |
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*ARS-040-001.r0*

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

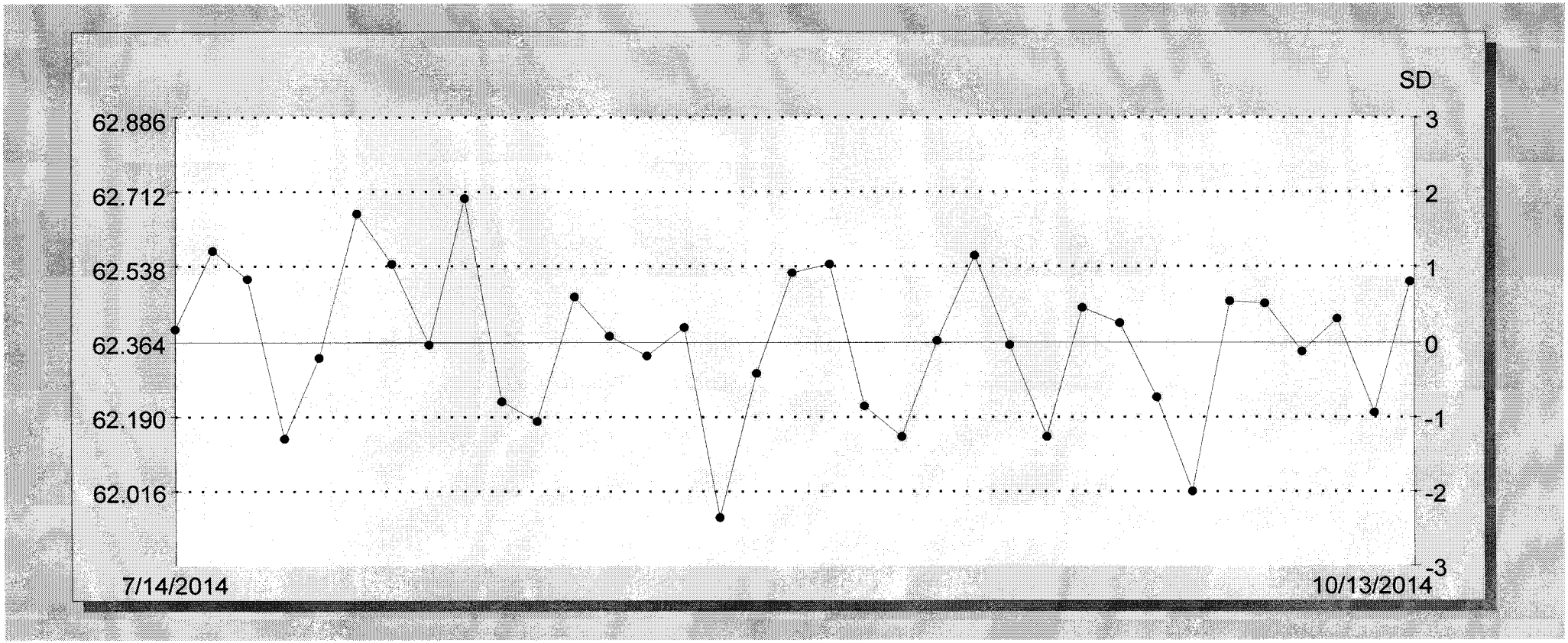
# Tritium-Screening by Low Level Liquid Scintillation Counting

# Control Charts

3H Efficiency
Total # pts : 5928
Valid # pts : 35
Mean : 62.37
SD : 0.17

| Date | Value | Valid Pt |
|---|---|---|
| Jul 14, 2014 | 62.39 | X |
| Jul 17, 2014 | 62.58 | X |
| Jul 18, 2014 | 62.51 | X |
| Jul 21, 2014 | 62.14 | X |
| Jul 25, 2014 | 62.33 | X |
| Jul 29, 2014 | 62.66 | X |
| Jul 30, 2014 | 62.54 | X |
| Aug 04, 2014 | 62.36 | X |
| Aug 07, 2014 | 62.70 | X |
| Aug 08, 2014 | 62.22 | X |
| Aug 11, 2014 | 62.18 | X |
| Aug 14, 2014 | 62.47 | X |
| Aug 15, 2014 | 62.38 | X |
| Aug 19, 2014 | 62.33 | X |
| Aug 20, 2014 | 62.40 | X |
| Aug 22, 2014 | 61.95 | X |
| Aug 29, 2014 | 62.29 | X |
| Sep 04, 2014 | 62.53 | X |
| Sep 05, 2014 | 62.55 | X |
| Sep 08, 2014 | 62.22 | X |
| Sep 12, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.37 | X |
| Sep 14, 2014 | 62.57 | X |
| Sep 14, 2014 | 62.36 | X |
| Sep 14, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.45 | X |
| Sep 17, 2014 | 62.41 | X |
| Sep 18, 2014 | 62.23 | X |
| Sep 26, 2014 | 62.02 | X |
| Sep 28, 2014 | 62.46 | X |
| Oct 01, 2014 | 62.45 | X |
| Oct 02, 2014 | 62.34 | X |
| Oct 05, 2014 | 62.42 | X |
| Oct 07, 2014 | 62.20 | X |
| Oct 13, 2014 | 62.50 | X |

3H Efficiency
Total # pts : 5928
Valid # pts : 35
Mean : 62.37
SD : 0.17

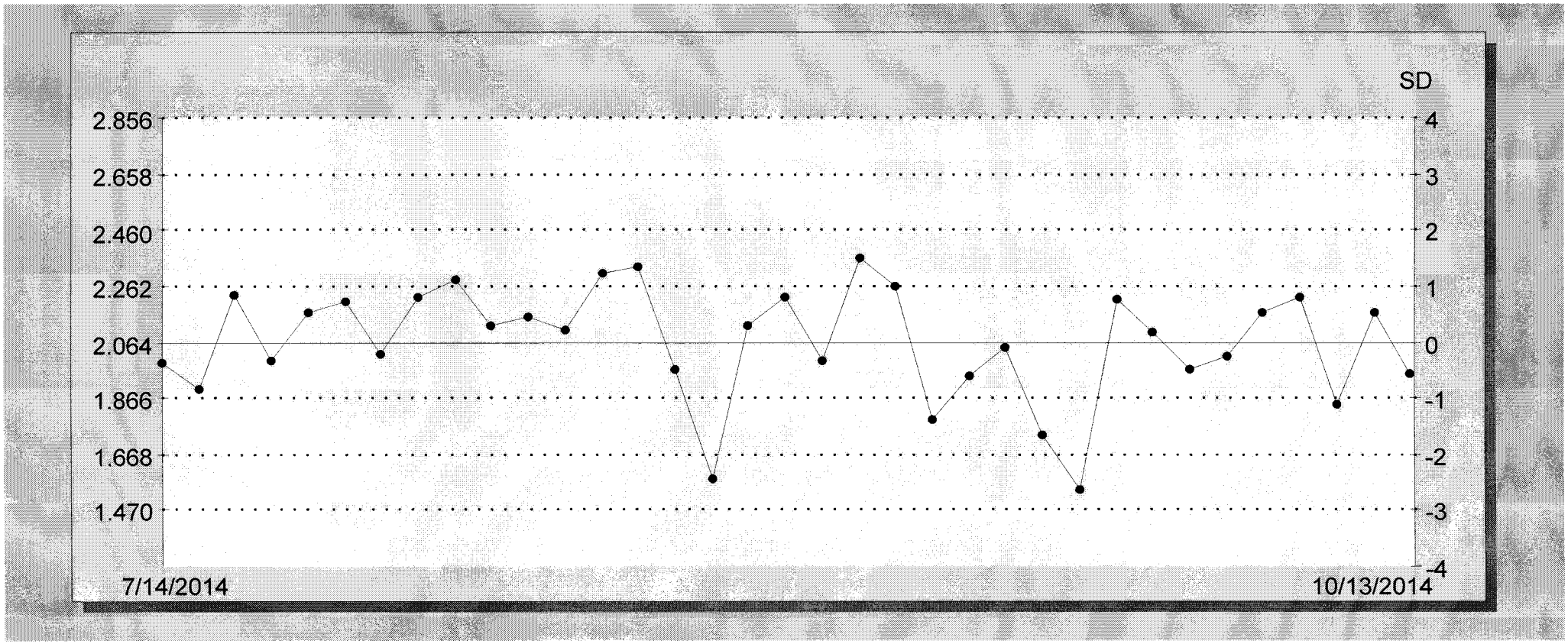


3H Background
Total # pts : 5853
Valid # pts : 35
Mean : 2.07
SD : 0.20

| Date | Value | Valid Pt |
|---|---|---|
| Jul 14, 2014 | 2.00 | X |
| Jul 17, 2014 | 1.90 | X |
| Jul 18, 2014 | 2.23 | X |
| Jul 21, 2014 | 2.00 | X |
| Jul 25, 2014 | 2.17 | X |
| Jul 29, 2014 | 2.21 | X |
| Jul 30, 2014 | 2.02 | X |
| Aug 04, 2014 | 2.22 | X |
| Aug 07, 2014 | 2.29 | X |
| Aug 08, 2014 | 2.12 | X |
| Aug 11, 2014 | 2.15 | X |
| Aug 14, 2014 | 2.11 | X |
| Aug 15, 2014 | 2.31 | X |
| Aug 19, 2014 | 2.33 | X |
| Aug 20, 2014 | 1.97 | X |
| Aug 22, 2014 | 1.58 | X |
| Aug 29, 2014 | 2.13 | X |
| Sep 04, 2014 | 2.22 | X |
| Sep 05, 2014 | 2.00 | X |
| Sep 08, 2014 | 2.36 | X |
| Sep 12, 2014 | 2.26 | X |
| Sep 14, 2014 | 1.79 | X |
| Sep 14, 2014 | 1.95 | X |
| Sep 14, 2014 | 2.05 | X |
| Sep 14, 2014 | 1.74 | X |
| Sep 14, 2014 | 1.54 | X |
| Sep 17, 2014 | 2.21 | X |
| Sep 18, 2014 | 2.10 | X |
| Sep 26, 2014 | 1.97 | X |
| Sep 28, 2014 | 2.01 | X |
| Oct 01, 2014 | 2.17 | X |
| Oct 02, 2014 | 2.22 | X |
| Oct 05, 2014 | 1.84 | X |
| Oct 07, 2014 | 2.17 | X |
| Oct 13, 2014 | 1.95 | X |

**3H Background**

| | |
|---|---|
| Total # pts | : 5853 |
| Valid # pts | : 35 |
| Mean | : 2.07 |
| SD | : 0.20 |



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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

## Low Level Liquid Scintillation Counting

# Calibration Information

Printed: 1/8/2014 8:41 AM

ARS INTERNATIONAL

QUALITY CONTROL PROGRAM

AMERICAN RADIATION SERVICES
RADIOACTIVE REFERENCE SOLUTIONS

# ANNUAL ACTIVITY VERIFICATION

VERIFICATION DATE: 1/7/2014 3:43 *date counted*
STANDARD REFERENCE #: S-0289

| Principal Radionuclide | | Half Life, Years | | Half Life, Days |
|---|---|---|---|---|
| H-3 | *ENTER -->* | | *OR -->* | 4.4998E+03 |
| | | 1.232E+01 | | 4.4998E+03 |

Radionuclide: H-3 Dilution Reference Date: 1/3/2014 13:25

| | | | |
|---|---|---|---|
| Dilution Activity | 2.66 | pCi per gram ===> dpm/g | 5.91 |
| Verif. Date Decay Corrected | 2.66 | pCi per gram ===> dpm/g | 5.90 |

*Minimum of 3 Required*

| Trial ID | Sample Counts | Count Time (min) | Detector | Efficiency | Bkg. (cpm) | Net Weight | Decay Corrected Activity Result (dpm/g) | Decay Corrected Activity Result (pCi/g) |
|---|---|---|---|---|---|---|---|---|
| S-0289-V1 | 21.75 | 1 | LSC | 0.3549 | 10.54 | 5.019 | 6.29 | 2.83 |
| S-0289-V2 | 20.53 | 1 | LSC | 0.3546 | 10.54 | 4.993 | 5.64 | 2.54 |
| S-0289-V3 | 20.60 | 1 | LSC | 0.3546 | 10.54 | 4.996 | 5.68 | 2.56 |
| S-0289-V4 | 21.00 | 1 | LSC | 0.3547 | 10.54 | 5.005 | 5.89 | 2.65 |
| S-0289-V5 | 21.18 | 1 | LSC | 0.3542 | 10.54 | 4.993 | 6.02 | 2.71 |

| | | |
|---|---|---|
| Average | 5.90 | 2.66 |
| Two Sigma Uncertainty | 0.52 | 0.24 |
| Standard Deviation percent of known concentration | 4.51% | 4.51% |
| Target Activity | 5.90 | 2.66 |
| % Diff | 0.00% | 0.00% |

*10% Max* *PASS*

*5% Max* *PASS*

Verification Expiration Date: January 7, 2015

Prepared & Counted By: [signature] Date: 1/7/2014 3:43

Verified & Approved By: D H Mulligan Date: 1-8-14

QC Approval: D H Mulligan Date: 1-8-14

S-0289
H-3
SL

| | |
|---|---|
| Manufactuer | NIST SRM 4927F |
| Sol Matrix | H2O |
| Ref No | NIST SRM 4927F |
| Tech | Unknown |
| Parent ID | S-0237 |

Verified 1/7/14
Expires 1/7/15

ARS INTERNATIONAL
RADIOACTIVE STANDARDS – BATON ROUGE LABORATORY

Assay Definition-

Assay Description:
H3 Normal Lvl

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\20140106_1733.results
RTF File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\H3 Normal Lvl2.lsa

Count Conditions-

Nuclide: Standard H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: PE UG STD H3
Count Time (min): 120.00
Count Mode: Normal
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: n/a
Colored Samples: Off Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

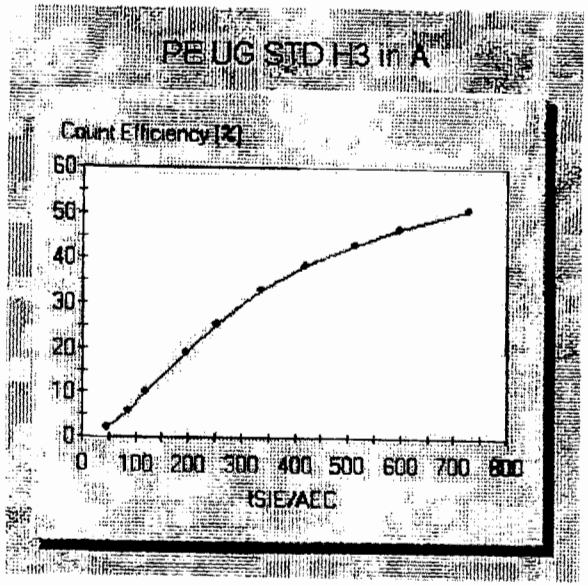
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 05/30/2013
Date Modified:
PE UG STD H3 in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 726.67 | 50.69 |
| 595.82 | 46.27 |
| 512.39 | 42.97 |
| 421.70 | 38.56 |
| 337.18 | 32.90 |
| 253.25 | 25.44 |
| 195.24 | 19.09 |
| 120.68 | 10.06 |
| 85.94 | 5.83 |
| 47.95 | 1.96 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | BACKGROUND | 10.54 | 29.70 | 375.63 | 35.48 | 120.00 | 1/6/2014 | 5:34:01 PM | |
| 20 | 2 | S-0289-V1 | 21.75 | 61.30 | 375.79 | 35.49 | 120.00 | 1/6/2014 | 7:35:52 PM | |
| 20 | 3 | S-0289-V2 | 20.53 | 57.89 | 375.34 | 35.46 | 120.00 | 1/6/2014 | 9:37:44 PM | |
| 20 | 4 | S-0289-V3 | 20.60 | 58.09 | 375.37 | 35.46 | 120.00 | 1/6/2014 | 11:39:36 PM | |
| 20 | 5 | S-0289-V4 | 21.00 | 59.21 | 375.58 | 35.47 | 120.00 | 1/7/2014 | 1:41:31 AM | |
| 20 | 6 | S-0289-V5 | 21.18 | 59.80 | 374.77 | 35.42 | 120.00 | 1/7/2014 | 3:43:23 AM | |

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

| Planning | |
|---|---|
| Planning Comments | Create an H-3 LCS standard |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.67265112 |
| Appx vol ml of Parent Sol'n | 3.679273813 |
| Expected Addition for Analysis g | 5 |

| Standards Preparation / Dilution | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 01/03/2013 13:25 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | 3.9375 |
| DPM Xferred on 01/03/2013 13:25 | 11793.25195 |
| Diluent/matrix | DI H2O |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.9 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | 2000 |
| Final Dilution Density (g/mL) | 0.99807 |
| Final Dilution Measured Mass g | 1996.14 |
| Comments | H3 LCS standard. Dilution performed as stated above by BSteffens on 1/3/13. BJS 1/3/13 |
| Final Dilution dpm/g | 5.908028472 |
| Final Dil New Ref Date/Time | 01/03/2013 13:25 |

## Parent Standard Data

| | | | |
|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | |
| Parent Solution # | S-0237 | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.3000000 |
| Parent Reference Date | 03/22/2010 10:10 | | |
| Parent Certified Act | 3503.682716 | Certi Act/Vol Units | dpm / g |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | |
| Parent Supplier | NIST SRM 4927F | | |
| Parent Date Recvd | 01/02/00 | | |
| Parent Received By | Unknown | | |
| Parent Cert Exp Date | | | |
| Parent Matrix | H2O | | |
| Certified dpm/g At Ref Date | 3503.682716 | | |
| Certified dpm/g on 01/03/2013 13:25 | 2995.111607 | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. -BJS 3/22/10 | | |
| Parent Tech | Unknown | | |
| Is_Primary | FALSE | | |
| Is_LCS | TRUE | | |
| Is_Tracer | FALSE | | |
| Is_Calib | FALSE | | |

**H-3 Standard Verification**

**Verifier's Name:** Brian Steffens **Date:** 1/6/2014

**Pipettor ID:** FJ40469

**Pipettor ID:** Auto-pipettor

**Pipettor ID:** na

**Standard ID:** S-0289

**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard |
|---|---|
| **S-0289-V1** | 5.019 g |
| **S-0289-V2** | 4.993 g |
| **S-0289-V3** | 4.996 g |
| **S-0289-V4** | 5.005 g |
| **S-0289-V5** | 4.993 g |
| | |
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| | |

**Balance ID:** H1331122173560P

**H-3 Standard Verification**

**Verifier's Name:** Brian Steffens **Date:** 1-6-14

**Pipettor ID:** FJ40469

**Pipettor ID:** Auto-pipettor

**Pipettor ID:** na

**Standard ID:** S-0289

**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard | |
|---|---|---|
| S-0289-V1 | 5.019 | g |
| S-0289-V2 | 4.993 | g |
| S-0289-V3 | 4.996 | g |
| S-0289-V4 | 5.005 | g |
| S-0289-V5 | 4.993 | g |
| | | |
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| | | |

**Balance ID:** H1331122173560P

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

### Planning

| | |
|---|---|
| Planning Comments | |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.884999595 |
| Appx vol ml of Parent Sol'n | 3.892005204 |
| Expected Addition for Analysis g | |

### Standards Preparation / Dilution

| | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 1-3-13 1325 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | |
| DPM Xferred on 01/03/2014 11:01 | |
| Diluent/matrix | |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.90 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | |
| Final Dilution Density (g/mL) | |
| Final Dilution Measured Mass g | |
| Comments | |
| Final Dilution dpm/g | |
| Final Dil New Ref Date/Time | 01/03/2014 11:01 |

## Parent Standard Data

| | | | | | |
|---|---|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | | | |
| Parent Solution # | S-0237 | | | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.8000000 | | |
| Parent Reference Date | 03/22/2010 10:10 | | | | |
| Parent Certified Act | 3503.682716 | Certi Act/Vol Units | dpm | g | |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | | | |
| Parent Supplier | NIST SRM 4927F | | | | |
| Parent Date Recvd | 01/02/00 | | | | |
| Parent Received By | Unknown | | | | |
| Parent Cert Exp Date | | | | | |
| Parent Matrix | H2O | | | | |
| Certified dpm/g At Ref Date | 3503.682716 | | | | |
| Certified dpm/g on 01/03/2014 11:01 | 2831.403127 | | | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. BJS 3/22/10 | | | | |
| Parent Tech | Unknown | | | | |
| Is_Primary | FALSE | | | | |
| Is_LCS | TRUE | | | | |
| Is_Tracer | FALSE | | | | |
| Is_Calib | FALSE | | | | |

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Folder Duplicate

# Report Compilation Checklist

ARS SDG: 14-02742 Client Name: LANL Sample Matrix: AQ

| LEVEL 1 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 1) Cover Page Complete and Accurate (see ARS-059)? | Yes No N/A | |
| 2) Technical Review Checklist(s) Complete and Accurate? | Yes No N/A | |
| 3) Case Narrative Complete and Accurate (see ARS-059)? | Yes No N/A | |
| 4) Form 1s Present for all Samples and Tests? | Yes No N/A | |
| 5) Client Specific Components are Present and Complete? | Yes No N/A | |

| LEVEL 2 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 6) Batch Quality Control Report is Present and Accurate? | Yes No N/A | |
| 7) DQO Report is Present and Accurate? | Yes No N/A | |
| 8) Client Specific Batch QC Components are Present and Complete? | Yes No N/A | |

| LEVEL 3 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 9) Efficiencies are Present? | Yes No N/A | |
| 10) Calibrations are Present? | Yes No N/A | |
| 11) Backgrounds are Present? | Yes No N/A | |
| 12) Spectrum Analysis is Present? | Yes No N/A | |
| 13) Spectral Plots are Present? | Yes No N/A | |
| 14) Plateaus are Present? | Yes No N/A | |
| 15) Control Charts are Present? | Yes No N/A | |
| 16) Other: | Yes No N/A | |

| LEVEL 4 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 17) Preparation Raw Data Present and Complete? | Yes No N/A | |
| 18) Instrument Raw Data Present and Complete? | Yes No N/A | |
| 19) Calibration Certificates Present? | Yes No N/A | |
| 20) Copies of Log Book Pages Present? | Yes No N/A | |
| 21) Sample Receiving Documentation Present? | Yes No N/A | |
| 22) LIMS Reports Present? | Yes No N/A | |
| 23) Applicable Correspondence Present? | Yes No N/A | |
| 24) Other: | Yes No N/A | |

Report Generator Signature 11-7-14 Date

Management Review Signature 11-7-14 Date

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-02742

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

**ARS A. Batch ID(s):** **Batch A:** B14-02479 **Batch B:** N/A **Batch C:** N/A

**Test Method(s):** LSC-A-021 N/A N/A

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| 1) 100% of Manual Transcriptions Verified? | Yes No N/A | Yes No N/A |
| 2) 100% of Manual Calculations Verified? | Yes No N/A | Yes No N/A |
| 3) Blank Composition/Configuration Matches Calibration? | Yes No N/A | Yes No N/A |
| 4) Deviations from procedure are documented and verified? | Yes No N/A | Yes No N/A |
| 5) Appropriate Cocktail Selected? | Yes No N/A | Yes No N/A |

6) Sample Prep Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

Chemist Signature: [signature] Date: 10-14-14 Verifier Review Signature: [signature] Date: 10-14-14

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| 1) Calibrations Valid and Current? | Yes No N/A | Yes No N/A |
| 2) Backgrounds Valid and Current? | Yes No N/A | Yes No N/A |
| 3) Source Checks Completed and Acceptable? | Yes No N/A | Yes No N/A |

QA Officer Signature: [signature] Date: 11-7-14

| | Analyst Review | Technicial Review |
|---|---|---|
| 4) Background Checks Complete and Acceptable? | Yes No N/A | Yes No N/A |
| 5) 100% of Manually Entered Parameters Verified Accurate? | Yes No N/A | Yes No N/A |
| 6) Appropriate QC samples initiated at required frequency? | Yes No N/A | Yes No N/A |
| 6) Test/Sample Specific Parameters (See ARS-059 for details) | | NA |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

7) Analysis Anomaly? ☑ No ☐ Yes (See Comments) NCR # (If initiated): _____

Analyst Signature: [signature] Date: 11-7-14 Technicial Reviewer Signature: NA Date

Batch A: B14-02479

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes No ~~N/A~~ | Yes No N/A |
| 2) RDL Criteria are Met? | Yes No ~~N/A~~ | Yes No N/A |
| 3) Method Blank Criterion Met? | Yes No ~~N/A~~ | Yes No N/A |
| 4) LCS/LCD Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |
| 6) MS/MSD Criteria Met? | Yes No ~~N/A~~ | Yes No N/A |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated):

| Project Manager Signature | Date | QA Officer Signature | Date |
|---|---|---|---|
| [signature] | 11-7-14 | James D. [signature] | 11-7-14 |

## GENERAL COMMENTS

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-02742

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

**ARS A. Batch ID(s):** **Batch A:** B14-02562 **Batch B:** N/A **Batch C:** N/A

**Test Method(s):** LSC-A-022 N/A N/A

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| 1) 100% of Manual Transcriptions Verified? | Yes No N/A | Yes No N/A |
| 2) 100% of Manual Calculations Verified? | Yes No N/A | Yes No N/A |
| 3) Blank Composition/Configuration Matches Calibration? | Yes No N/A | Yes No N/A |
| 4) Deviations from procedure are documented and verified? | Yes No N/A | Yes No N/A |
| 5) Appropriate Cocktail Selected? | Yes No N/A | Yes No N/A |

6) Sample Prep Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

Chemist Signature: [signature] Date: 11-5-14 Verifier Review Signature: [signature] Date: 11-6-14

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| 1) Calibrations Valid and Current? | Yes No N/A | Yes No N/A |
| 2) Backgrounds Valid and Current? | Yes No N/A | Yes No N/A |
| 3) Source Checks Completed and Acceptable? | Yes No N/A | Yes No N/A |

QA Officer Signature: [signature] Date: 11-7-14

| | Analyst Review | Technicial Review |
|---|---|---|
| 4) Background Checks Complete and Acceptable? | Yes No N/A | Yes No N/A |
| 5) 100% of Manually Entered Parameters Verified Accurate? | Yes No N/A | Yes No N/A |
| 6) Appropriate QC samples initiated at required frequency? | Yes No N/A | Yes No N/A |
| 6) Test/Sample Specific Parameters (See ARS-059 for details) | | |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

7) Analysis Anomaly? ☑ No ☐ Yes (See Comments) NCR # (If initiated): _____

Analyst Signature: [signature] Date: ~~11-6-14~~ 11-7-14 Technicial Reviewer Signature: [signature] Date: 11-7-14

11-7-14

Batch A: B14-02562

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes ~~No~~ N/A | Yes (No) N/A |
| 2) RDL Criteria are Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 3) Method Blank Criterion Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 4) LCS/LCD Criteria Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 6) MS/MSD Criteria Met? | Yes No ~~N/A~~ | Yes No (N/A) |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

| Project Manager Signature | Date | QA Officer Signature | Date |
|---|---|---|---|
| SDL | 11-7-14 | James D. Fu | 11-7-14 |

## GENERAL COMMENTS

# DQO Report for SDG
ARS1-14-02742



| Analysis Code | Group | Isotope | Activity Units | Aliquot Units | ProcedureNo | RDL | LCS_LL | LCS_UL | MS_LL | MS_UL | RadY_LL | RadY_UL | GravY_LL | GravY_LL | RER | RPD | DiltionReq | RoughPrepReq | BlankCorrectionMDA | BlankCorrectionAll | CountTimeReq | AliquotRequired |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L9C-A-021 | STD | H-3 | pCi | L | ARS-054 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | | |
| LSC-A-022 | STD | Enriched H-3 | pCi | L | ARS-040 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | | |

# SDG Report - Samples and Containers

**SDG Specific Data**

| | | | | | |
|---|---|---|---|---|---|
| SDG | ARS1-14-02742 | TAT Days | 28 | Project Type | Environmental |
| Sample Count | 3 Rpt Level 4 | Date Received | 10/9/2014 | COC Number | 2015-49 |
| Client | Los Alamos National Laboratory | Client Deadline | 11/6/2014 | PO Number | |
| Client Code | 114 | Internal Deadline | 11/5/2014 | Job Number | |
| Profile Number | PN-00094 | Lab Deadline | 11/3/2014 | Job Location | |
| Comments | | | | | |

**Samples and Containers (➔) Checked In Thus Far**

| FR | ClientID | Matrix | SampleStartDate | SampleEndDate | Disp | Hold | Arch | Storage | X | Units | Y | Units | Z | Units | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | CAWR-14-86933 | AQ | 09/30/14 01:30 PM | 09/30/14 01:30 PM | H | 90 | 5 | M3 | | | | | | | |
| ➔ | IC_ID | Cnt | Volume_mL | Wt_g | pH_Orig | pH_Final | CPM | uR_Hr | Storage | VOA | Head Sp | AF Units | AF Rate | AF Mins | AF Total Vol |
| | 176948 | 1 | 1000.00 | | | | 80 | 26 | | N | N/A | | | | |
| 002 | CAWR-14-86935 | AQ | 10/06/14 09:40 AM | 10/06/14 09:40 AM | H | 90 | 5 | M3 | | | | | | | |
| ➔ | IC_ID | Cnt | Volume_mL | Wt_g | pH_Orig | pH_Final | CPM | uR_Hr | Storage | VOA | Head Sp | AF Units | AF Rate | AF Mins | AF Total Vol |
| | 176949 | 1 | 1000.00 | | | | 80 | 26 | | N | N/A | | | | |
| 003 | CAWR-14-86874 | AQ | 10/06/14 12:35 PM | 10/06/14 12:35 PM | H | 90 | 5 | M3 | | | | | | | |
| ➔ | IC_ID | Cnt | Volume_mL | Wt_g | pH_Orig | pH_Final | CPM | uR_Hr | Storage | VOA | Head Sp | AF Units | AF Rate | AF Mins | AF Total Vol |
| | 176950 | 1 | 1000.00 | | | | 80 | 26 | | N | N/A | | | | |

# SDG Report - Analysis Assignments

| | | | |
|---|---|---|---|
| Temp SDG | ARS1-14-02742 | Sample Count | 3 |
| Client | Los Alamos National Laboratory | Analysis Count | 2-6 |

**Samples Count Totals per Analysis**

| Analysis Code | Analysis Description | Samples Count |
|---|---|---|
| LSC-A-021 | Low Level Tritium Screen in (Aqueous) | 3 |
| LSC-A-022 | Low Level Tritium by Enrichment Process in (Aqueous [AQ]) | 3 |

**Analyses Assigned Per Fraction**

| Fraction | Analysis Code | X = Assigned |
|---|---|---|
| 001 | LSC-A-021 | X |
| 001 | LSC-A-022 | X |
| 002 | LSC-A-021 | X |
| 002 | LSC-A-022 | X |
| 003 | LSC-A-021 | X |
| 003 | LSC-A-022 | X |

# ARS FILE TRACKING SHEET

**SDG:** ARS1-14-02742

| Task | Date / Time | Initials |
|---|---|---|
| Date & Time Samples Received | 10-09-14 10:48 | JH |
| ICOC Initiated/Storage Location: M3 | 10-09-14 12:03 | JH |
| Technical Checks Performed | See Batch | |
| Report Written / EDD Generated 11-7-14 / 1122 / SDL | 11-7-14 / 1115 | SDL |
| Quality Assurance Checks Performed on Report | 11-7-14 1305 | JDT |
| Management Checks Performed on Report | | |
| *Preliminary Report Scan* | | |
| Report E-mailed/Faxed | | |
| Invoice Completed Invoice #:_____ | | |
| Requires Report Mailed Yes / ~~No~~ | | |
| Requires Original COC mailed Yes / ~~No~~ | | |
| Report Reviewed and Imaged | | |

## SPECIAL REQUIREMENTS

| Requirement | Yes | No |
|---|---|---|
| 3 Hour Rush | ☐ | ☑ |
| 24 Hour Rush | ☐ | ☑ |
| 48 Hour Rush | ☐ | ☑ |
| 3 Day Rush | ☐ | ☑ |
| 5 Day Rush | ☐ | ☑ |
| 10 Day Rush | ☐ | ☑ |
| Standard Oil/Gas Client (5 Day) | ☐ | ☑ |
| Standard Turnaround | ☑ | ☐ |

**NOTES**

ARS-062-005 r6

**COMPANY NAME:** CANL

**SDG:** ARS1-14-0214-2

**SHIPPING CONTAINER**

| | | |
|---|---|---|
| Good Condition | ☑ Yes | ☐ No |
| Radioactive | ☐ Yes | ☑ No |
| UN2910 | ☐ Yes | ☑ No |
| Sec. Seals | ☐ Yes | ☑ No |
| Seals Intact | ☐ Yes ☐ No | ☑ N/A |
| Air Bill | ☐ Yes | ☑ No |

**COC PRESENT WITH SAMPLES**

| | | |
|---|---|---|
| COC | ☑ Yes | ☐ No |

**SAMPLE CONTAINER(S)**

| | | |
|---|---|---|
| Good Condition | ☑ Yes | ☐ No |
| Sec. Seals | ☑ Yes | ☐ No |
| Seal Intact | ☑ Yes ☐ No | ☐ N/A |
| Marked Radioactive | ☐ Yes | ☑ No |

# Samples Rcv 3

Matrix [ AF , AQ , BI , FE , LT , SI , SO , UR , VG ]

**External and Internal Surveys**

| | | | | | |
|---|---|---|---|---|---|
| Exposure Rate Meter | M3 242861 | Serial No.: | PR 264266 | Calibration Due Date: | 4/16/15 |
| Count Rate Meter | M2 154859 | Serial No.: | PR 184559 | Calibration Due Date: | 4/16/15 |

| | | | | |
|---|---|---|---|---|
| Background Exposure Rate (µR/hr) | 26 | Max. Exposure Rate on Shipping Containers Externals (Plus Bkgd) | 26 | µR/hr |
| Background Count Rate (cpm) | 80 | Max. Removable Count Rate on Shipping Containers Externals (Plus Bkgd) | 80 | cpm |
| | | Max. Removable Count Rate on Shipping Containers Internals (Plus Bkgd) | 80 | cpm |

| Sample Label/Comments/Notes | pH Orig (pH ≤ 2 is Acceptable) | pH Final | Mark if Preserve | Acid Lot # | Weight(g) / Volume(mL) | µR/hr (Acceptance Limits <500 µR/hr) | cpm (Acceptance Limits <100 cpm/cm²) |
|---|---|---|---|---|---|---|---|
| CAWR-H-86933 | 10.9.14 | | ☐ | | 1000 | 26 | 80 |
| CAWR-H-86935 | | | ☐ | | 1000 | 26 | 80 |
| CAWR-H-86874 | | | ☐ | | 1000 | 26 | 80 |
| | | | ☐ | | | | |
| | | | ☐ | | | | |
| | | | ☐ | | | | |
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| | | | ☐ | | | | |
| | | | ☐ | | | | |
| | | | ☐ | | | | |

Surveyors Name: [signature]

Date/Time Surveyed: 10.9.14 @ 1048

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-49

Page 1 of 1

**Client Contact:**

**Lab Agreement # :** 63641-001-10

**Project Number :**

**Site Name:** Los Alamos National Laboratory

**Analysis Turnaround Time:**
- 24 Hour - ☐
- Other - ☐
- 7 Day - ☐
- 14 Day - ☐
- 21 Day - ☐
- 28 Day - ☒

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-86933 | Sep 30 2014 | 13:30 | W | 1 |
| CAWR-14-86935 | Oct 6 2014 | 09:40 | W | 1 |
| CAWR-14-86874 | Oct 6 2014 | 12:35 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Marsh | 10/8/14 3:00 | | J. Holliday | 10.9.14/0940 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

**COC/Lab Request #:** 2015-187



**Client Contact:**

**Lab Agreement # :** 126310011

**Project Number :**

**Analysis Turnaround Time:**

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89228 | Oct 29 2014 | 13:00 | W | | 3 | | 2 | 3 | | | | | | | |
| CAWR-14-89231 | Oct 29 2014 | 10:00 | W | 1 | 3 | 2 | 2 | 3 | | 1 | | 1 | | 1 | 1 |
| CAWR-14-89235 | Oct 29 2014 | 10:00 | W | | | | | | 1 | | 1 | | 1 | | |
| CAWR-14-89227 | Oct 29 2014 | 10:00 | W | | | 2 | | | | | | | | | |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martinez | 10/30/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89227

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/29/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1000 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DL |
| LOCATION ID: Spring 2 | | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FTB | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | QC | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Tosh

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| [illegible] | 10/29/14 1415 | K. Greene | 10/29/14 2115 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89228 **WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/29/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1300 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: | La Mesita Spring | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | SPR | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-8082-PCB | 1 LITER AMBER GLASS | 2 | ICE 10/29/14 | Y | NA |
| ↓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS | 2 | ICE 10/29/14 | ↓ | ↓ |

**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:** minor sediment present

**FIELD PARAMETERS:**

Dissolved Oxygen 8.34 mg/L Flow (in gpm) 0.17 GPM Oxidation-Reduction Potential NA mV

pH 7.69 SU Specific Conductance 318 uS/cm Temperature 14.99 deg C

Turbidity 7.2 NTU

**COLLECTED BY (PRINT)** A. Tosh

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Aidan Stoker | 10/29/14 1415 | K. Greene | 10/29/14 2115 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89231

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/29/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1000 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Spring 2 | | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: SPR | | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| ↓ | WSP-8082-PCB | 1 LITER AMBER GLASS 10/29/14 | ~~3~~ 2 | ICE | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS 10/29/14 | ~~3~~ 2 | ICE | ↓ | ↓ |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | ↓ | ↓ |
| ↓ | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | ↓ | ↓ |
| ↓ | WSP-RAD | 1 GAL POLY | 1 | HNO3 | ↓ | ↓ |
| ↓ | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

| | | | |
|---|---|---|---|
| **EVENT ID:** | 6955 | **EVENT NAME:** | White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions |
| **SAMPLE ID:** | CAWR-14-89231 | **WORK ORDER:** | NA |

**SAMPLE COMMENTS:** possibly small invertebrates in sample b/c seen in pool, also some organics (leaf matter) in samples

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.35 mg/L Flow (in gpm) 0.4 GPM Oxidation-Reduction Potential NA mV

pH 7.53 SU Specific Conductance 238 uS/cm Temperature 12.65 deg C

Turbidity 27.7 NTU

**COLLECTED BY (PRINT)** S. Bernhill

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name)** Andrew Stocker **(Signature)** | **Date/Time** 10/29/14 1415 | **RECEIVED BY (Printed Name)** K. Greene **(Signature)** | **Date/Time** 10/29/14 2115 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89235

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/29/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1000 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Spring 2 | | ↓ | FIELD PREP: | F | ok |
| LOCATION TYPE: SPR | | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | NA |
| ↓ | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/29/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT):** A. Toth + J. Berryhill

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stryker | 10/29/14 1415 | K. Greene | 10/29/14 2115 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
| | | | |

Report Date 10/08/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-187

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 360220 | EPA:120.1 | 1 | | | | |
| 360220 | EPA:150.1 | 1 | | | | |
| 360220 | EPA:160.1 | 1 | | | | |
| 360220 | EPA:245.2 | 2 | | | | |
| 360220 | EPA:300.0 | 1 | | | | |
| 360220 | EPA:310.1 | 1 | | | | |
| 360220 | EPA:335.4 | 1 | | | | |
| 360220 | EPA:350.1 | 1 | | | | |
| 360220 | EPA:351.2 | 1 | | | | |
| 360220 | EPA:353.2 | 1 | | | | |
| 360220 | EPA:365.4 | 1 | | | | |
| 360220 | EPA:900 | 1 | | | | |
| 360220 | EPA:901.1 | 1 | | | | |
| 360220 | EPA:905.0 | 1 | | | | |
| 360220 | HASL-300:AM-241 | 1 | | | | |
| 360220 | HASL-300:ISOPU | 1 | | | | |
| 360220 | HASL-300:ISOU | 1 | | | | |
| 360220 | SM:A2340B | 1 | | | | |
| 360220 | SW-846:6010C | 1 | | | | |
| 360220 | SW-846:6020 | 1 | | | | |
| 360220 | SW-846:6850 | 1 | | | | |
| 360220 | SW-846:8082 | 2 | | | | |
| 360220 | SW-846:8260B | 1 | | 1 | | |
| 360220 | SW-846:8270D | 2 | | | | |
| 360220 | SW-846:8321A_MOD | 2 | | | | |
| 360220 | SW-846:9060 | 1 | | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360220 | EPA:120.1 | 1433707 | 1433707 | 1 | | | | | | | | | | 1 | | | | 2 | | | |
| 360220 | EPA:150.1 | 1433708 | 1433708 | 1 | | | | | | | | | | 1 | | | | 2 | | | |
| 360220 | EPA:160.1 | 1432682 | 1432682 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 360220 | EPA:245.2 | 1435631 | 1435624 | 2 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | EPA:300.0 | 1436786 | 1436786 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 360220 | EPA:310.1 | 1435239 | 1435239 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | EPA:335.4 | 1432348 | 1432347 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | EPA:350.1 | 1432165 | 1432164 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | EPA:351.2 | 1432167 | 1432166 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | EPA:353.2 | 1432964 | 1432964 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360220 | EPA:365.4 | 1432171 | 1432170 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | EPA:900 | 1433352 | 1433352 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | 1 | | | |
| 360220 | EPA:901.1 | 1432024 | 1432024 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360220 | EPA:905.0 | 1434929 | 1434929 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | HASL-300:AM-241 | 1432557 | 1432557 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360220 | HASL-300:ISOPU | 1432558 | 1432558 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360220 | HASL-300:ISOU | 1432560 | 1432560 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360220 | SM:A2340B | 1437813 | 1437813 | 1 | | | | | | | | | | | | | | | | | |
| 360220 | SW-846:6010C | 1432513 | 1432512 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | SW-846:6020 | 1432537 | 1432536 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360220 | SW-846:6850 | 1432727 | 1432726 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 360220 | SW-846:8082 | 1435829 | 1435828 | 2 | | | | | 1 | 1 | | | | 1 | 1 | | | | | | |
| 360220 | SW-846:8260B | 1434601 | 1434601 | 1 | | 1 | | | 2 | | | | | 4 | | | | | | | |
| 360220 | SW-846:8270D | 1433097 | 1433096 | 2 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 360220 | SW-846:8321A_MOD | 1433023 | 1433022 | 2 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 360220 | SW-846:9060 | 1435687 | 1435687 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CAPA-14-87212 | 1203203373 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203203372 | LCS | 0 | 0 | 1 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | WSTMO-14-86604 | 1203203374 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAPA-14-87212 | 1203203395 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203203393 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | WSTMO-14-86604 | 1203203394 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAPA-14-87212 | 1203200889 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-89235 | 1203200888 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203200887 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203200886 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-89231 | 360220006 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203208388 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203208387 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | WST05-15-90481 | 1203208389 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | WST05-15-90481 | 1203208390 | MS | 0 | 0 | 1 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAPA-14-89329 | 1203211473 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CASA-15-90258 | 1203211474 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-89235 | 360220007 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203211472 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203211471 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-14-87212 | 1203207410 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-14-87212 | 1203207413 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-89235 | 360220007 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203207407 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203207405 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAPA-14-87192 | 1203200100 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAPA-14-87192 | 1203200103 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-89231 | 360220006 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203200098 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203200097 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-89235 | 1203201187 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-89235 | 1203201188 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203199678 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203199677 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-14-87192 | 1203199685 | DUP | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-14-87192 | 1203199686 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-89231 | 360220006 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203199684 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203199683 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203201559 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203201558 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | WSTMO-14-87592 | 1203201561 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAPA-14-87218 | 1203199699 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAPA-14-87218 | 1203199700 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203199696 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203199695 | MB | 1 | 0 | 0 | 0 |
| EPA:900 | RAD | CAPA-14-87204 | 1203202543 | DUP | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAPA-14-87204 | 1203202544 | MS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | CAPA-14-87204 | 1203202545 | MSD | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | CAWR-14-89231 | 360220006 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | LCS | 1203202546 | LCS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | MB | 1203202542 | MB | 2 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAMO-14-87137 | 1203199357 | DUP | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-89231 | 360220006 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | LCS | 1203199358 | LCS | 0 | 0 | 3 | 0 |
| EPA:901.1 | RAD | MB | 1203199356 | MB | 5 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAPA-14-87194 | 1203206648 | DUP | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAPA-14-87194 | 1203206649 | MS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | CAWR-14-89231 | 360220006 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | LCS | 1203206650 | LCS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | MB | 1203206647 | MB | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAMO-14-87137 | 1203200602 | DUP | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-89231 | 360220006 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | LCS | 1203200603 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:AM-241 | RAD | MB | 1203200601 | MB | 1 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAMO-14-87137 | 1203200605 | DUP | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-89231 | 360220006 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | LCS | 1203200606 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOPU | RAD | MB | 1203200604 | MB | 2 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAMO-14-87137 | 1203200611 | DUP | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-89231 | 360220006 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | LCS | 1203200612 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOU | RAD | MB | 1203200610 | MB | 3 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SM:A2340B | INORGANIC | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-89235 | 1203200493 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-89235 | 1203200494 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-89235 | 360220007 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203200492 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203200491 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-89235 | 1203200563 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-89235 | 1203200564 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-89235 | 360220007 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203200562 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203200561 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-89235 | 1203200968 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-89235 | 1203200969 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-89235 | 360220007 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203200967 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203200966 | MB | 1 | 0 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-89228 | 360220001 | REG | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-89231 | 360220004 | REG | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | LCS | 1203208930 | LCS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | LCSD | 1203208933 | LCSD | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | MB | 1203208929 | MB | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | WSTMO-14-86605 | 1203208931 | MS | 0 | 2 | 2 | 0 |
| SW-846:8260B | VOC | CAWR-14-89227 | 360220008 | FTB | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-89231 | 360220006 | REG | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | LCS | 1203205733 | LCS | 0 | 3 | 70 | 0 |
| SW-846:8260B | VOC | LCS | 1203205734 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | LCS | 1203209451 | LCS | 0 | 3 | 70 | 0 |
| SW-846:8260B | VOC | LCS | 1203209452 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203205732 | MB | 80 | 3 | 0 | 0 |
| SW-846:8260B | VOC | MB | 1203209450 | MB | 80 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-89228 | 360220002 | REG | 80 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-89231 | 360220006 | REG | 80 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | LCS | 1203201873 | LCS | 0 | 6 | 76 | 0 |
| SW-846:8270D | SVOC | MB | 1203201872 | MB | 80 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | WSTMO-14-86605 | 1203201874 | MS | 0 | 6 | 76 | 0 |
| SW-846:8270D | SVOC | WSTMO-14-86605 | 1203201875 | MSD | 0 | 6 | 76 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | CAWR-14-89228 | 360220003 | REG | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | CAWR-14-89231 | 360220005 | REG | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | LCS | 1203201688 | LCS | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | MB | 1203201687 | MB | 20 | 2 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8321A_MOD | LCMS/MS HIGH | WSTMO-14-86605 | 1203201689 | MS | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | WSTMO-14-86605 | 1203201690 | MSD | 0 | 2 | 20 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-15-90216 | 1203208553 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAPA-14-87201 | 1203208552 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-89231 | 360220006 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203208551 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203208550 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

| Field Sample ID | Lab Sample ID | Analytical Method | Sample Date | Extraction Date | Analysis Date | Extraction Hold Time | Max Extract Hold Time | Reject Above | Exceeds Limit | Analysis Hold Time | Max Analysis Hold Time | Reject Above | Exceeds Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89231 | 360220005 | SW-846:8321A_MOD | 10-29-2014 | 11-05-2014 | 11-20-2014 | 7 | 7 | 14 | X | 15 | 40 | 40 | |
| CAWR-14-89231 | 360220005 | SW-846:8321A_MOD | 10-29-2014 | 11-05-2014 | 11-30-2014 | 7 | 7 | 14 | X | 25 | 40 | 40 | |
| CAWR-14-89231 | 360220006 | SW-846:9060 | 10-29-2014 | | 11-17-2014 | NA | | | | 19 | 14 | 28 | X |

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203200491 | METHOD BLANK | SW-846:6010C | W | Potassium | 54.3 | J | ug/L | 150 |
| MB | 1203200491 | METHOD BLANK | SW-846:6010C | W | Strontium | -1.18 | J | ug/L | 5.00 |
| MB | 1203200491 | METHOD BLANK | SW-846:6010C | W | Zinc | 5.31 | J | ug/L | 10.0 |

# DATA VALIDATION REPORT

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203200561 | METHOD BLANK | SW-846:6020 | W | Uranium | .073 | J | ug/L | 0.200 |

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89235 | 1203200491 | METHOD BLANK | SW-846:6010C | Strontium | -1.18 | ug/L | 186 | | 5.00 | Y | | | |
| CAWR-14-89235 | 1203200561 | METHOD BLANK | SW-846:6020 | Uranium | .073 | ug/L | 3.08 | | 0.200 | Y | 5 | 100 | Y |

6. Any surrogate recoveries outside the control limits?

| Field Sample ID | Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Spike Recovery | Upper Limit | Lower Limit | Rejection Limit |
|---|---|---|---|---|---|---|---|---|---|
| WSTMO-14-86605 | 1203201874 | SW-846:8270D | Fluorophenol[2-] | 1433097 | 11-04-2014 | 15 | 84 | 18 | |
| WSTMO-14-86605 | 1203201875 | SW-846:8270D | Tribromophenol[2,4,6-] | 1433097 | 11-04-2014 | 28 | 126 | 33 | |
| WSTMO-14-86605 | 1203201874 | SW-846:8270D | Tribromophenol[2,4,6-] | 1433097 | 11-04-2014 | 7 | 126 | 33 | |

7. Any MS/MSD recoveries or RPDs outside the control limits?

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPA-14-87192 | 1203200103 | | EPA:335.4 | Cyanide (Total) | 1432347 | 11-06-2014 | W | 115 | | 110 | 90 | 10 | | |

# DATA VALIDATION REPORT

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203200612 | | HASL-300:ISOU | Uranium-232 | 1432560 | 11-17-2014 | W | 46.2 | | 105 | 50 | | 10 | | |
| 1203205733 | | SW-846:8260B | Dichlorodifluoromethane | 1434601 | 11-10-2014 | W | 139 | | 134 | 52 | | 10 | | |
| 1203205733 | | SW-846:8260B | Trichlorofluoromethane | 1434601 | 11-10-2014 | W | 130 | | 129 | 69 | | 10 | | |
| 1203209451 | | SW-846:8260B | Propylbenzene[1-] | 1434601 | 11-13-2014 | W | 70 | | 121 | 75 | | 10 | | |
| 1203201688 | | SW-846:8321A_MOD | HMX | 1433022 | 11-30-2014 | W | 121 | | 118 | 61 | | 10 | | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

| Field Sample ID | Lab Sample ID | LD Lab Sample ID | Analytical Method | Parameter Name | Sample Matrix | Lab Result | LD Lab Result | Lab Units | Detect Flag | LD Detect Flag | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89235 | 360220007 | 1203200888 | EPA:160.1 | Total Dissolved | W | 113 | 137 | mg/L | Y | Y | 19.4 | 10 |
| CAWR-14-89235 | 360220007 | 1203201187 | EPA:350.1 | Ammonia as | W | 0.127 | 0.0677 | mg/L | Y | Y | 60.9 | 20 |

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2 | 2015-187 | CAWR-14-89227 | FTB | INIT | VOC | SW-846:8260B | Propylbenzene[1-] | U | UJ | V12a | N | 1.00 | ug/L | 1.00 | ug/L | | | W | 10/29/2014 | | 1434601 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | 2,4-Diamino-6-nitrotoluene | UQ | UJ | HE9 | N | 2.63 | ug/L | 2.63 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | 2,6-Diamino-4-nitrotoluene | UQ | UJ | HE9 | N | 2.63 | ug/L | 2.63 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | 3,5-Dinitroaniline | U | UJ | HE9 | N | 1.05 | ug/L | 1.05 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | 0 | pCi/L | 0 | pCi/L | 0.0557 | 0.00533 | W | 10/29/2014 | | 1432557 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Amino-2,6-dinitrotoluene[4-] | UQ | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Amino-4,6-dinitrotoluene[2-] | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | .78 | pCi/L | .78 | pCi/L | 6.47 | 1.96 | W | 10/29/2014 | | 1432024 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | .0359 | pCi/L | .0359 | pCi/L | 6.48 | 1.97 | W | 10/29/2014 | | 1432024 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Dinitrobenzene[1,3-] | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Dinitrotoluene[2,4-] | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Dinitrotoluene[2,6-] | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | HMX | UQ | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | -3.16 | pCi/L | -3.16 | pCi/L | 12.7 | 3.77 | W | 10/29/2014 | | 1432024 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Nitrobenzene | UQ | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Nitrotoluene[2-] | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Nitrotoluene[3-] | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Nitrotoluene[4-] | U | UJ | HE9 | N | 0.526 | ug/L | 0.526 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | PETN | U | UJ | HE9 | N | 0.526 | ug/L | 0.526 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | -.00625 | pCi/L | -.00625 | pCi/L | 0.0311 | 0.00644 | W | 10/29/2014 | | 1432558 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | .011 | pCi/L | .011 | pCi/L | 0.0461 | 0.00609 | W | 10/29/2014 | | 1432558 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | 7.7 | pCi/L | 7.7 | pCi/L | 72.8 | 18.8 | W | 10/29/2014 | | 1432024 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | VOC | SW-846:8260B | Propylbenzene[1-] | U | UJ | V12a | N | 1.00 | ug/L | 1.00 | ug/L | | | W | 10/29/2014 | | 1434601 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | RDX | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | 1.43 | pCi/L | 1.43 | pCi/L | 6.63 | 1.58 | W | 10/29/2014 | | 1432024 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | -.183 | pCi/L | -.183 | pCi/L | 0.495 | 0.127 | W | 10/29/2014 | | 1434929 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | TATB | U | UJ | HE9 | N | 1.05 | ug/L | 1.05 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Tetryl | U | UJ | HE9 | N | 0.526 | ug/L | 0.526 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | | J- | I9 | Y | 1.23 | mg/L | 1.23 | mg/L | | | W | 10/29/2014 | | 1435687 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Trinitrobenzene[1,3,5-] | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Trinitrotoluene[2,4,6-] | U | UJ | HE9 | N | 0.263 | ug/L | 0.263 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89231 | REG | INIT | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Tris (o-cresyl) phosphate | U | UJ | HE9 | N | 1.05 | ug/L | 1.05 | ug/L | | | W | 10/29/2014 | | 1433023 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2 | 2015-187 | CAWR-14-89235 | REG | INIT | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | | J | I10a | Y | 0.127 | mg/L | 0.127 | mg/L | | | W | 10/29/2014 | | 1432165 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89235 | REG | INIT | GENERAL CHEMISTRY | EPA:160.1 | Total Dissolved Solids | | J | I10a | Y | 113 | mg/L | 113 | mg/L | | | W | 10/29/2014 | | 1432682 | VAL | Y |
| Spring 2 | 2015-187 | CAWR-14-89235 | REG | INIT | INORGANIC | SW-846:6020 | Uranium | | J | I4a | Y | 3.08 | ug/L | 3.08 | ug/L | | | W | 10/29/2014 | | 1432537 | VAL | Y |

| Reason Code | Description |
|---|---|
| HE9 | The holding time was >1 and <=2 times the applicable holding time requirement. |
| I10a | The sample and the duplicate sample results were >=5X the RL and the duplicate RPD was >20% for water samples and >35% for soil samples. |
| I4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x |
| I9 | The holding time was >1 and <=2 times the applicable holding time requirement. |
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| R5 | Analyte is not detected because the amount reported is less than the MDC. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |
| V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-89227 | Spring 2 | FTB | SW-846:8260B | 0 | 80 |
| CAWR-14-89228 | La Mesita Spring | REG | SW-846:8082 | 0 | 8 |
| CAWR-14-89228 | La Mesita Spring | REG | SW-846:8270D | 0 | 80 |
| CAWR-14-89228 | La Mesita Spring | REG | SW-846:8321A_MOD | 0 | 20 |
| CAWR-14-89231 | Spring 2 | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-89231 | Spring 2 | REG | EPA:335.4 | 0 | 1 |
| CAWR-14-89231 | Spring 2 | REG | EPA:351.2 | 0 | 1 |
| CAWR-14-89231 | Spring 2 | REG | EPA:900 | 0 | 2 |
| CAWR-14-89231 | Spring 2 | REG | EPA:901.1 | 0 | 5 |
| CAWR-14-89231 | Spring 2 | REG | EPA:905.0 | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-89231 | Spring 2 | REG | HASL-300:AM-241 | 0 | 1 |
| CAWR-14-89231 | Spring 2 | REG | HASL-300:ISOPU | 0 | 2 |
| CAWR-14-89231 | Spring 2 | REG | HASL-300:ISOU | 0 | 3 |
| CAWR-14-89231 | Spring 2 | REG | SW-846:8082 | 0 | 8 |
| CAWR-14-89231 | Spring 2 | REG | SW-846:8260B | 0 | 80 |
| CAWR-14-89231 | Spring 2 | REG | SW-846:8270D | 0 | 80 |
| CAWR-14-89231 | Spring 2 | REG | SW-846:8321A_MOD | 0 | 20 |
| CAWR-14-89231 | Spring 2 | REG | SW-846:9060 | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | EPA:120.1 | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | EPA:150.1 | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | EPA:160.1 | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | EPA:300.0 | 0 | 4 |
| CAWR-14-89235 | Spring 2 | REG | EPA:310.1 | 0 | 2 |
| CAWR-14-89235 | Spring 2 | REG | EPA:350.1 | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | EPA:353.2 | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | EPA:365.4 | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | SM:A2340B | 0 | 1 |
| CAWR-14-89235 | Spring 2 | REG | SW-846:6010C | 0 | 17 |
| CAWR-14-89235 | Spring 2 | REG | SW-846:6020 | 0 | 11 |
| CAWR-14-89235 | Spring 2 | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
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P 843.556.8171 F 843.766.1178
www.gel.com

November 20, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL- WQH Water Samples
Work Order: 360220
SDG: 2015-187

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on October 31, 2014, and analyzed for Explosives by LCMSMS, GC Semivolatile PCB, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Chain of Custody: 2015-187
Enclosures

**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL- WQH Water Samples**
**Work Order #: 360220**
**SDG: 2015-187**

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# Case Narrative

**Case Narrative for**
**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL- WQH Water Samples**
**Workorder #: 360220**
**SDG # : 2015-187**

**November 20, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on October 31, 2014 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 360220001 | CAWR-14-89228 |
| 360220002 | CAWR-14-89228 |
| 360220003 | CAWR-14-89228 |
| 360220004 | CAWR-14-89231 |
| 360220005 | CAWR-14-89231 |
| 360220006 | CAWR-14-89231 |
| 360220007 | CAWR-14-89235 |
| 360220008 | CAWR-14-89227 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Explosives by LCMSMS, GC Semivolatile PCB, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 20 November 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−14−9 |
| Utah NELAP | SC000122014−16 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

360220

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-187

Page 1 of 1

Client Contact:

Lab Agreement # : 126310011

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89228 | Oct 29 2014 | 13:00 | W | | 3 | | 2 | 3 | | | | | | | |
| CAWR-14-89231 | Oct 29 2014 | 10:00 | W | 1 | 3 | 2 | 2 | 3 | | 1 | | 1 | | 1 | 1 |
| CAWR-14-89235 | Oct 29 2014 | 10:00 | W | | | | | | 1 | | 1 | | 1 | | |
| CAWR-14-89227 | Oct 29 2014 | 10:00 | W | | | 2 | | | | | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martinez | 10/30/14 3:00 | Shanta Mack | Shanta Mack | 9:00 10/31/14 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| Client: LANL | SDG/AR/COC/Work Order: 2015-187 |
| Received By: SHANTA MACK | Date Received: 10/31/14 @ 9:00 |

| Suspected Hazard Information | Yes | No | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | ✓ | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 30 cpm |
| Classified Radioactive II or III by RSO? | | ✓ | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | ✓ | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | ✓ | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | ✓ | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | ✓ | |

| | Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | ✓ | | | Preservation Method: Ice ~~bags~~ Blue ice Dry ice None Other (describe) 2°, 3° *all temperatures are recorded in Celsius 18 RAD |
| 2a | Daily check performed and passed on IR temperature gun? | ✓ | | | Temperature Device Serial #: 130532792 Secondary Temperature Device Serial # (If Applicable): |
| 3 | Chain of custody documents included with shipment? | ✓ | | | |
| 4 | Sample containers intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | ✓ | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | ✓ | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | ✓ | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | ✓ | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | ✓ | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | ✓ | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | | | ✓ | Sample ID's affected: See email for containers not received |
| 12 | Are sample containers identifiable as GEL provided? | | | ✓ | |
| 13 | COC form is properly signed in relinquished/received sections? | ✓ | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other<br>5908 1778 8267 5908 1778 0304<br>5908 1778 8245 5908 1778 0223<br>5908 1778 0289 5908 1778 0234<br>5908 1778 0278 5908 1778 0337<br>5908 1778 0348 5908 1778 0256<br>5908 1778 0315 5908 1778 0326<br>5908 1778 0290 |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials VSO Date 11/3/14 Page 1 of 1

GL-CHL-SR-001

**Subject:** Sample Receipt 10/31/14
**From:** Shanta Mack <sha01289@gel.com>
**Date:** Fri, 31 Oct 2014 20:57:33 -0400
**To:** Keith Green <kgreene@lanl.gov>, team.DAVIS@GEL.COM

RN 2015-187

CAPA-14-89228 Lab received 2 containers for PCB & 2 containers for HEXP
CAPA-14-89231 Lab received 2 containers for PCB & 2 containers for HEXP
CAPA-14-89227 Lab received 1 VOA 8260

RN 2015-188

CAPA-14-87186 Lab received 2 containers for PCB
CAPA-14-8759 Lab received 1 VOA 8260

Shanta Mack <sha01289@gel.com>
Project Manager Assistant
Customer Service
The Gel Group

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

2c

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

FedEx Express

2 of 2
MPS# 0263 5908 1778 0337
Mstr# 5908 1778 0326

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

0201

X7 CHSA

29407
SC-US CHS

Part # 159148-434 RITZ 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 55.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3c

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A0140GZ00

FedEx Express

2 of 2
MPS# 0263 5908 1778 0234
Mstr# 5908 1778 0223

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

0201

X7 CHSA

29407
SC-US CHS

Part # 159148-434 RITZ 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

2c

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A014OGZ00

FedEx Express

2 of 3
MPS# 0263 5908 1778 0256
Mstr# 5908 1778 0245 0201

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 150149-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3c

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

FedEx Express

1 of 2
TRK# 0201 5908 1778 0326
## MASTER ##

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 150149-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A0140GZ00

3

FedEx Express

3 of 3
MPS# 0263 5908 1778 0290
Mstr# 5908 1778 0278

0201

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 159148-436 RITZ 10/11 ©

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 55.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A0140GZ00

3

FedEx Express

1 of 2
TRK# 0201 5908 1778 0304
## MASTER ##

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 159148-436 RITZ 10/11 ©

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 22.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3c

CHARLESTON SC 29407
(843) 556-8171
REF: WE6L115510000

FedEx Express

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 0201 5908 1778 0348

X7 CHSA

29407
SC-US CHS

Part # 150149-434 RITA 10/11 ©

---

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

2c

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A0140GZ00

FedEx Express

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

2 of 2
MPS# 0263 5908 1778 0315
Mstr# 5908 1778 0304
0201

X7 CHSA

29407
SC-US CHS

Part # 150149-434 RITA 10/11 ©

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3c

CHARLESTON SC 29407
(843) 566-8171
REF: MR1A0140GZ00

FedEx Express

2 of 3

MPS# 0263 5908 1778 0289

Mstr# 5908 1778 0278 0201

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3c

CHARLESTON SC 29407
(843) 566-8171
REF: MR1A0140GZ00

FedEx Express

1 of 3

TRK# 0201 5908 1778 0278

## MASTER ##

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PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11

18c

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 58.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A0140GZ00

FedEx Express

1 of 2

TRK# 0201 5908 1778 0223

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

## MASTER ##

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11 ©

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 37.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

18c

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A0140GZ00

FedEx Express

1 of 3

TRK# 0201 5908 1778 0245

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

## MASTER ##

X7 CHSA

29407
SC-US CHS

Part # 156148-434 RIT2 10/11 ©

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30OCT14
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

2L

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A0140GZ00

FedEx Express

3 of 3
MPS# 0263 5908 1778 0267
Mstr# 5908 1778 0245

0201

FRI - 31 OCT 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

PAM # 1531-48-434 RUTZ 10/14 ©

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# Case Narrative

**ChemStation Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-187**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer** |
| Analytical Method: | SW846 8260B DOE-AL |
| Analytical Batch Number: | 1434601 |

## Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 360220008 | CAWR-14-89227 |
| 1203205732 | Method Blank (MB) |
| 1203205733 | Laboratory Control Sample (LCS) |
| 1203205734 | Laboratory Control Sample (LCS) |
| 1203205735 | 360759006(WST05-15-90482) Post Spike (PS) |
| 1203205736 | 360759006(WST05-15-90482) Post Spike (PS) |
| 1203205737 | 360759006(WST05-15-90482) Post Spike Duplicate (PSD) |
| 1203205738 | 360759006(WST05-15-90482) Post Spike Duplicate (PSD) |
| 1203209450 | Method Blank (MB) |
| 1203209451 | Laboratory Control Sample (LCS) |
| 1203209452 | Laboratory Control Sample (LCS) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

## Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an

industry shortage.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Blank (MB) Statement**
The blanks analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

**Laboratory Control Sample (LCS) Recovery**
The LCS 1203205733 (LCS) and 1203209451 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported.

**QC Sample Designation**
Sample 360759006 (WST05-15-90482) was designated for spike analysis.

**Matrix Spike (PS) Recovery Statement**
The spike recoveries were within the required acceptance limits.

**Matrix Spike Duplicate (PSD) Recovery Statement**
The spike duplicate recoveries were within the required acceptance limits.

**Relative Percent Difference (RPD) Statement**
The RPDs between the matrix spike pair met the acceptance limits.

**Internal Standard (ISTD) Acceptance**
The internal standard responses in all client and quality control samples met the required acceptance criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Sample Preservation and Integrity**
All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-analyses were not required for samples in this SDG.

**Miscellaneous Information**

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1355677.

**Manual Integrations**
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

**Additional Comments**
Additional comments were not required for this SDG.

**Residual Chlorine**
Residual Chlorine was not detected in any of the samples in this SDG.

**System Configuration**

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|---|---|---|---|---|---|
| VOA1.I | Agilent 6890/5973 GC/MS w/ OI 4560/Archon Autosampler | HP6890/HP5973 | RTX-624 | Restek, 60m x 0.25mm x 1.4um | Trap 10 |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-187  GEL Work Order: 360220

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert  **Name: Erin Haubert**

**Date: 25 NOV 2014**  **Title: Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220006** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89231** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 18:07** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 18:07** | | | | |
| **Data File:** | **111014V1\1I118.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220006** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89231** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 18:07** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 18:07** | | | | |
| **Data File:** | **111014V1\1I118.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220006** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89231** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 18:07** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 18:07** | | | | |
| **Data File:** | **111014V1\1I118.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.9 | 50.0 | ug/L | 106 | (77%-123%) |
| Bromofluorobenzene | 44.0 | 50.0 | ug/L | 88.0 | (80%-120%) |
| Toluene-d8 | 46.3 | 50.0 | ug/L | 92.6 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220008** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89227** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 14:49** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 14:49** | | | | |
| **Data File:** | **111014V1\1I112.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220008** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89227** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 14:49** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 14:49** | | | | |
| **Data File:** | **111014V1\1I112.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220008** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89227** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 14:49** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 14:49** | | | | |
| **Data File:** | **111014V1\1I112.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.3 | 50.0 | ug/L | 105 | (77%-123%) |
| Bromofluorobenzene | 44.1 | 50.0 | ug/L | 88.1 | (80%-120%) |
| Toluene-d8 | 46.3 | 50.0 | ug/L | 92.5 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Quality Control Summary

**Volatile**

## Surrogate Recovery Report

**SDG Number: 2015-187**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|---|---|---|---|---|
| 1203205733 | LCS for batch 1434601 | 96 | 90 | 85 |
| 1203205734 | LCS for batch 1434601 | 100 | 92 | 86 |
| 1203205732 | MB for batch 1434601 | 100 | 93 | 87 |
| 360220008 | CAWR-14-89227 | 105 | 93 | 88 |
| 360220006 | CAWR-14-89231 | 106 | 93 | 88 |
| 1203209451 | LCS for batch 1434601 | 105 | 88 | 86 |
| 1203209452 | LCS for batch 1434601 | 102 | 88 | 85 |
| 1203209450 | MB for batch 1434601 | 104 | 89 | 87 |
| 1203205735 | WST05-15-90482PS | 99 | 89 | 87 |
| 1203205737 | WST05-15-90482PSD | 107 | 89 | 87 |
| 1203205736 | WST05-15-90482PS | 98 | 88 | 88 |
| 1203205738 | WST05-15-90482PSD | 97 | 88 | 87 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| DCED4 | = 1,2-Dichloroethane-d4 | (77%-123%) |
| TOL | = Toluene-d8 | (80%-120%) |
| BFB | = Bromofluorobenzene | (80%-120%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205733**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 10:26**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 101 | 101 | 78-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 991 | 79 | 60-124 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 258 | 103 | 55-147 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 285 | 114 | 72-126 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 262 | 105 | 73-135 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 231 | 92 | 61-133 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 227 | 91 | 57-145 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 209 | 84 | 67-128 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 206 | 83 | 59-147 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 69.4 | 139 * | 52-134 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 47.3 | 95 | 57-126 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 52.7 | 105 | 62-126 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 56.8 | 114 | 63-127 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 47.6 | 95 | 69-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 65.0 | 130 * | 69-129 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 48.2 | 96 | 72-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 55.0 | 110 | 70-127 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 47.1 | 94 | 70-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 50.4 | 101 | 74-120 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 51.4 | 103 | 73-120 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 50.8 | 102 | 75-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 52.9 | 106 | 76-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205733**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 10:26**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 61.8 | 124 | 76-131 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 57.3 | 115 | 76-122 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 55.7 | 111 | 76-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 64.0 | 128 | 76-131 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 52.6 | 105 | 73-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 66.8 | 134 | 76-135 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 55.1 | 110 | 71-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 48.8 | 98 | 75-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 57.0 | 114 | 77-123 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 45.3 | 91 | 76-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 53.1 | 106 | 77-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 55.9 | 112 | 78-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 53.9 | 108 | 78-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 48.4 | 97 | 75-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 54.2 | 108 | 78-124 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 47.4 | 95 | 76-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 46.3 | 93 | 73-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 57.5 | 115 | 73-125 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 61.4 | 123 | 72-131 |
| 106-93-4 | LCS | 1,2-Dibromoethane | 50.0 | 0.0 | 52.1 | 104 | 79-120 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 50.5 | 101 | 77-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 51.1 | 102 | 77-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205733**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 10:26**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 50.4 | 101 | 78-120 |
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 49.9 | 100 | 79-124 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 62.4 | 125 | 65-132 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 50.1 | 100 | 76-123 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 46.3 | 93 | 72-122 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 50.2 | 100 | 71-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 50.5 | 101 | 76-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 47.0 | 94 | 75-121 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 50.0 | 100 | 77-122 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 50.8 | 102 | 76-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 47.7 | 95 | 76-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 52.0 | 104 | 77-127 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 48.8 | 98 | 77-121 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 51.5 | 103 | 77-124 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 52.7 | 105 | 77-126 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 50.4 | 101 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 50.4 | 101 | 76-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 49.0 | 98 | 76-127 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.0 | 53.1 | 106 | 60-130 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 60.3 | 121 | 69-133 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 52.4 | 105 | 67-129 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 55.1 | 110 | 66-131 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205733**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 10:26**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 54.3 | 109 | 68-132 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 58.2 | 116 | 80-126 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 50.6 | 101 | 77-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4940 | 99 | 61-135 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205734**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 12:05**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 248 | 99 | 61-132 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 333 | 133 | 67-139 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 242 | 97 | 64-124 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 246 | 98 | 68-123 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 253 | 101 | 69-128 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 243 | 97 | 66-124 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 263 | 105 | 73-123 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 236 | 94 | 75-122 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 3090 | 124 | 64-132 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 60.0 | 120 | 60-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WST05-15-90482PS**
**Lab Sample ID** **1203205735**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:00**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PS | m,p-Xylenes | 100 | 0.00 | U | 79.3 | 79 | 69-122 |
| 75-05-8 | PS | Acetonitrile | 1250 | 0.00 | U | 812 | 65 | 54-130 |
| 78-93-3 | PS | 2-Butanone | 250 | 2.70 | J | 169 | 66 | 30-145 |
| 74-88-4 | PS | Iodomethane | 250 | 0.00 | U | 264 | 106 | 69-128 |
| 75-15-0 | PS | Carbon disulfide | 250 | 0.00 | U | 198 | 79 | 68-138 |
| 108-05-4 | PS | Vinyl acetate | 250 | 0.00 | U | 170 | 68 | 50-137 |
| 108-10-1 | PS | 4-Methyl-2-pentanone | 250 | 0.00 | U | 182 | 73 | 60-132 |
| 591-78-6 | PS | 2-Hexanone | 250 | 0.00 | U | 139 | 55 | 38-144 |
| 67-64-1 | PS | Acetone | 250 | 203 | | 336 | 53 | 27-155 |
| 75-71-8 | PS | Dichlorodifluoromethane | 50.0 | 0.00 | U | 45.0 | 90 | 37-143 |
| 74-87-3 | PS | Chloromethane | 50.0 | 0.00 | U | 34.9 | 70 | 48-132 |
| 75-01-4 | PS | Vinyl chloride | 50.0 | 0.00 | U | 38.2 | 76 | 53-132 |
| 74-83-9 | PS | Bromomethane | 50.0 | 0.00 | U | 48.3 | 97 | 60-132 |
| 75-00-3 | PS | Chloroethane | 50.0 | 0.00 | U | 35.4 | 71 | 66-120 |
| 75-69-4 | PS | Trichlorofluoromethane | 50.0 | 0.00 | U | 52.5 | 105 | 64-131 |
| 60-29-7 | PS | Ethyl ether | 50.0 | 0.00 | U | 41.0 | 82 | 69-119 |
| 75-35-4 | PS | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 41.5 | 83 | 65-129 |
| 75-09-2 | PS | Methylene chloride | 50.0 | 0.00 | U | 40.6 | 81 | 68-119 |
| 1634-04-4 | PS | tert-Butyl methyl ether | 50.0 | 0.00 | U | 45.2 | 90 | 70-123 |
| 156-60-5 | PS | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 40.7 | 81 | 68-123 |
| 75-34-3 | PS | 1,1-Dichloroethane | 50.0 | 0.00 | U | 41.1 | 82 | 71-122 |
| 156-59-2 | PS | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 45.2 | 90 | 72-122 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Sample Type:** **Post Spike**
**Client ID:** **WST05-15-90482PS**
**Matrix:** **W**
**Lab Sample ID** **1203205735**
**Instrument:** **VOA1.I**
**Analysis Date:** **11/14/2014 02:00**
**Dilution: 1**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PS | 2,2-Dichloropropane | 50.0 | 0.00 | U | 46.5 | 93 | 69-131 |
| 74-97-5 | PS | Bromochloromethane | 50.0 | 0.00 | U | 54.6 | 109 | 74-123 |
| 67-66-3 | PS | Chloroform | 50.0 | 0.00 | U | 49.5 | 99 | 72-123 |
| 71-55-6 | PS | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 52.7 | 105 | 71-133 |
| 563-58-6 | PS | 1,1-Dichloropropene | 50.0 | 0.00 | U | 40.8 | 82 | 68-125 |
| 56-23-5 | PS | Carbon tetrachloride | 50.0 | 0.00 | U | 55.8 | 112 | 70-139 |
| 107-06-2 | PS | 1,2-Dichloroethane | 50.0 | 0.00 | U | 53.7 | 107 | 67-123 |
| 71-43-2 | PS | Benzene | 50.0 | 0.00 | U | 39.2 | 78 | 71-118 |
| 79-01-6 | PS | Trichloroethylene | 50.0 | 0.00 | U | 46.0 | 92 | 68-130 |
| 78-87-5 | PS | 1,2-Dichloropropane | 50.0 | 0.00 | U | 37.1 | 74 | 72-118 |
| 74-95-3 | PS | Dibromomethane | 50.0 | 0.00 | U | 50.3 | 101 | 74-122 |
| 75-27-4 | PS | Bromodichloromethane | 50.0 | 0.00 | U | 53.1 | 106 | 75-129 |
| 10061-01-5 | PS | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 44.3 | 89 | 73-125 |
| 108-88-3 | PS | Toluene | 50.0 | 0.00 | U | 38.3 | 77 | 69-119 |
| 10061-02-6 | PS | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 44.7 | 89 | 73-125 |
| 79-00-5 | PS | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 40.9 | 82 | 73-118 |
| 142-28-9 | PS | 1,3-Dichloropropane | 50.0 | 0.00 | U | 41.9 | 84 | 71-116 |
| 127-18-4 | PS | Tetrachloroethylene | 50.0 | 0.00 | U | 45.3 | 91 | 65-128 |
| 124-48-1 | PS | Dibromochloromethane | 50.0 | 0.00 | U | 57.3 | 115 | 68-133 |
| 106-93-4 | PS | 1,2-Dibromoethane | 50.0 | 0.00 | U | 47.0 | 94 | 76-122 |
| 108-90-7 | PS | Chlorobenzene | 50.0 | 0.00 | U | 41.2 | 82 | 71-119 |
| 100-41-4 | PS | Ethylbenzene | 50.0 | 0.00 | U | 38.8 | 78 | 70-121 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WST05-15-90482PS**
**Lab Sample ID** **1203205735**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:00**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 95-47-6 | PS | o-Xylene | 50.0 | 0.00 | U | 40.3 | 81 | 70-123 |
| 100-42-5 | PS | Styrene | 50.0 | 0.00 | U | 40.5 | 81 | 72-127 |
| 75-25-2 | PS | Bromoform | 50.0 | 0.00 | U | 59.7 | 119 | 60-133 |
| 98-82-8 | PS | Isopropylbenzene | 50.0 | 0.00 | U | 38.6 | 77 | 67-127 |
| 79-34-5 | PS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 41.5 | 83 | 67-125 |
| 96-18-4 | PS | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 50.7 | 101 | 68-123 |
| 108-86-1 | PS | Bromobenzene | 50.0 | 0.00 | U | 44.2 | 88 | 69-120 |
| 103-65-1 | PS | n-Propylbenzene | 50.0 | 0.00 | U | 33.4 | 67 | 65-125 |
| 108-67-8 | PS | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 38.7 | 77 | 67-126 |
| 95-49-8 | PS | 2-Chlorotoluene | 50.0 | 0.00 | U | 38.1 | 76 | 67-122 |
| 106-43-4 | PS | 4-Chlorotoluene | 50.0 | 0.00 | U | 35.6 | 71 | 66-121 |
| 98-06-6 | PS | tert-Butylbenzene | 50.0 | 0.00 | U | 40.5 | 81 | 67-130 |
| 95-63-6 | PS | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 36.8 | 74 | 66-124 |
| 135-98-8 | PS | sec-Butylbenzene | 50.0 | 0.00 | U | 37.9 | 76 | 67-128 |
| 99-87-6 | PS | 4-Isopropyltoluene | 50.0 | 0.00 | U | 38.8 | 78 | 66-129 |
| 541-73-1 | PS | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 40.7 | 81 | 67-120 |
| 106-46-7 | PS | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 40.1 | 80 | 66-118 |
| 104-51-8 | PS | n-Butylbenzene | 50.0 | 0.00 | U | 35.7 | 71 | 63-131 |
| 96-12-8 | PS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 | U | 55.0 | 110 | 55-131 |
| 87-68-3 | PS | Hexachlorobutadiene | 50.0 | 0.00 | U | 47.8 | 96 | 55-138 |
| 91-20-3 | PS | Naphthalene | 50.0 | 0.00 | U | 48.1 | 96 | 61-131 |
| 87-61-6 | PS | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 44.6 | 89 | 56-133 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Sample Type:** **Post Spike**
**Client ID:** **WST05-15-90482PS**
**Matrix:** **W**
**Lab Sample ID** **1203205735**
**Instrument:** **VOA1.I**
**Analysis Date:** **11/14/2014 02:00**
**Dilution: 1**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 120-82-1 | PS | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 44.7 | 89 | 56-131 |
| 630-20-6 | PS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 52.4 | 105 | 76-129 |
| 95-50-1 | PS | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 43.0 | 86 | 69-119 |
| 71-36-3 | PS | n-Butyl alcohol | 5000 | 112 | | 4710 | 92 | 55-141 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WST05-15-90482PSD**
**Lab Sample ID** **1203205737**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:32**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PSD | m,p-Xylenes | 100 | 0.00 | U | 82.2 | 82 | 69-122 | 4 | 0-20 |
| 75-05-8 | PSD | Acetonitrile | 1250 | 0.00 | U | 894 | 72 | 54-130 | 10 | 0-20 |
| 78-93-3 | PSD | 2-Butanone | 250 | 2.70 | J | 184 | 73 | 30-145 | 9 | 0-20 |
| 74-88-4 | PSD | Iodomethane | 250 | 0.00 | U | 284 | 114 | 69-128 | 7 | 0-20 |
| 75-15-0 | PSD | Carbon disulfide | 250 | 0.00 | U | 216 | 86 | 68-138 | 9 | 0-20 |
| 108-05-4 | PSD | Vinyl acetate | 250 | 0.00 | U | 182 | 73 | 50-137 | 7 | 0-20 |
| 108-10-1 | PSD | 4-Methyl-2-pentanone | 250 | 0.00 | U | 182 | 73 | 60-132 | 0 | 0-20 |
| 591-78-6 | PSD | 2-Hexanone | 250 | 0.00 | U | 136 | 54 | 38-144 | 2 | 0-20 |
| 67-64-1 | PSD | Acetone | 250 | 203 | | 365 | 65 | 27-155 | 8 | 0-20 |
| 75-71-8 | PSD | Dichlorodifluoromethane | 50.0 | 0.00 | U | 44.5 | 89 | 37-143 | 1 | 0-20 |
| 74-87-3 | PSD | Chloromethane | 50.0 | 0.00 | U | 36.0 | 72 | 48-132 | 3 | 0-20 |
| 75-01-4 | PSD | Vinyl chloride | 50.0 | 0.00 | U | 38.7 | 77 | 53-132 | 2 | 0-20 |
| 74-83-9 | PSD | Bromomethane | 50.0 | 0.00 | U | 50.8 | 102 | 60-132 | 5 | 0-20 |
| 75-00-3 | PSD | Chloroethane | 50.0 | 0.00 | U | 37.6 | 75 | 66-120 | 6 | 0-20 |
| 75-69-4 | PSD | Trichlorofluoromethane | 50.0 | 0.00 | U | 53.1 | 106 | 64-131 | 1 | 0-20 |
| 60-29-7 | PSD | Ethyl ether | 50.0 | 0.00 | U | 44.0 | 88 | 69-119 | 7 | 0-20 |
| 75-35-4 | PSD | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 44.5 | 89 | 65-129 | 7 | 0-20 |
| 75-09-2 | PSD | Methylene chloride | 50.0 | 0.00 | U | 43.4 | 87 | 68-119 | 7 | 0-20 |
| 1634-04-4 | PSD | tert-Butyl methyl ether | 50.0 | 0.00 | U | 48.6 | 97 | 70-123 | 7 | 0-20 |
| 156-60-5 | PSD | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 43.3 | 87 | 68-123 | 6 | 0-20 |
| 75-34-3 | PSD | 1,1-Dichloroethane | 50.0 | 0.00 | U | 44.3 | 89 | 71-122 | 8 | 0-20 |
| 156-59-2 | PSD | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 49.2 | 98 | 72-122 | 8 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WST05-15-90482PSD**
**Lab Sample ID** **1203205737**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:32**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PSD | 2,2-Dichloropropane | 50.0 | 0.00 | U | 49.8 | 100 | 69-131 | 7 | 0-20 |
| 74-97-5 | PSD | Bromochloromethane | 50.0 | 0.00 | U | 57.9 | 116 | 74-123 | 6 | 0-20 |
| 67-66-3 | PSD | Chloroform | 50.0 | 0.00 | U | 53.0 | 106 | 72-123 | 7 | 0-20 |
| 71-55-6 | PSD | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 58.1 | 116 | 71-133 | 10 | 0-20 |
| 563-58-6 | PSD | 1,1-Dichloropropene | 50.0 | 0.00 | U | 45.0 | 90 | 68-125 | 10 | 0-20 |
| 56-23-5 | PSD | Carbon tetrachloride | 50.0 | 0.00 | U | 60.9 | 122 | 70-139 | 9 | 0-20 |
| 107-06-2 | PSD | 1,2-Dichloroethane | 50.0 | 0.00 | U | 55.9 | 112 | 67-123 | 4 | 0-20 |
| 71-43-2 | PSD | Benzene | 50.0 | 0.00 | U | 41.7 | 83 | 71-118 | 6 | 0-20 |
| 79-01-6 | PSD | Trichloroethylene | 50.0 | 0.00 | U | 48.2 | 96 | 68-130 | 5 | 0-20 |
| 78-87-5 | PSD | 1,2-Dichloropropane | 50.0 | 0.00 | U | 40.3 | 81 | 72-118 | 8 | 0-20 |
| 74-95-3 | PSD | Dibromomethane | 50.0 | 0.00 | U | 53.8 | 108 | 74-122 | 7 | 0-20 |
| 75-27-4 | PSD | Bromodichloromethane | 50.0 | 0.00 | U | 56.2 | 112 | 75-129 | 6 | 0-20 |
| 10061-01-5 | PSD | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 48.5 | 97 | 73-125 | 9 | 0-20 |
| 108-88-3 | PSD | Toluene | 50.0 | 0.00 | U | 39.7 | 79 | 69-119 | 4 | 0-20 |
| 10061-02-6 | PSD | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 46.3 | 93 | 73-125 | 3 | 0-20 |
| 79-00-5 | PSD | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 42.3 | 85 | 73-118 | 3 | 0-20 |
| 142-28-9 | PSD | 1,3-Dichloropropane | 50.0 | 0.00 | U | 41.7 | 83 | 71-116 | 0 | 0-20 |
| 127-18-4 | PSD | Tetrachloroethylene | 50.0 | 0.00 | U | 46.7 | 93 | 65-128 | 3 | 0-20 |
| 124-48-1 | PSD | Dibromochloromethane | 50.0 | 0.00 | U | 59.1 | 118 | 68-133 | 3 | 0-20 |
| 106-93-4 | PSD | 1,2-Dibromoethane | 50.0 | 0.00 | U | 48.0 | 96 | 76-122 | 2 | 0-20 |
| 108-90-7 | PSD | Chlorobenzene | 50.0 | 0.00 | U | 42.9 | 86 | 71-119 | 4 | 0-20 |
| 100-41-4 | PSD | Ethylbenzene | 50.0 | 0.00 | U | 41.6 | 83 | 70-121 | 7 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WST05-15-90482PSD**
**Lab Sample ID** **1203205737**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:32**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-47-6 | PSD | o-Xylene | 50.0 | 0.00 | U | 41.7 | 83 | 70-123 | 3 | 0-20 |
| 100-42-5 | PSD | Styrene | 50.0 | 0.00 | U | 41.7 | 83 | 72-127 | 3 | 0-20 |
| 75-25-2 | PSD | Bromoform | 50.0 | 0.00 | U | 60.4 | 121 | 60-133 | 1 | 0-20 |
| 98-82-8 | PSD | Isopropylbenzene | 50.0 | 0.00 | U | 39.8 | 80 | 67-127 | 3 | 0-20 |
| 79-34-5 | PSD | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 42.1 | 84 | 67-125 | 2 | 0-20 |
| 96-18-4 | PSD | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 50.3 | 101 | 68-123 | 1 | 0-20 |
| 108-86-1 | PSD | Bromobenzene | 50.0 | 0.00 | U | 44.9 | 90 | 69-120 | 2 | 0-20 |
| 103-65-1 | PSD | n-Propylbenzene | 50.0 | 0.00 | U | 36.4 | 73 | 65-125 | 9 | 0-20 |
| 108-67-8 | PSD | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 41.4 | 83 | 67-126 | 7 | 0-20 |
| 95-49-8 | PSD | 2-Chlorotoluene | 50.0 | 0.00 | U | 41.0 | 82 | 67-122 | 7 | 0-20 |
| 106-43-4 | PSD | 4-Chlorotoluene | 50.0 | 0.00 | U | 38.2 | 76 | 66-121 | 7 | 0-20 |
| 98-06-6 | PSD | tert-Butylbenzene | 50.0 | 0.00 | U | 43.6 | 87 | 67-130 | 7 | 0-20 |
| 95-63-6 | PSD | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 39.4 | 79 | 66-124 | 7 | 0-20 |
| 135-98-8 | PSD | sec-Butylbenzene | 50.0 | 0.00 | U | 41.1 | 82 | 67-128 | 8 | 0-20 |
| 99-87-6 | PSD | 4-Isopropyltoluene | 50.0 | 0.00 | U | 41.9 | 84 | 66-129 | 8 | 0-20 |
| 541-73-1 | PSD | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 41.4 | 83 | 67-120 | 2 | 0-20 |
| 106-46-7 | PSD | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 41.9 | 84 | 66-118 | 4 | 0-20 |
| 104-51-8 | PSD | n-Butylbenzene | 50.0 | 0.00 | U | 38.6 | 77 | 63-131 | 8 | 0-20 |
| 96-12-8 | PSD | 1,2-Dibromo-3-chloropropane | 50.0 | 0.00 | U | 57.1 | 114 | 55-131 | 4 | 0-20 |
| 87-68-3 | PSD | Hexachlorobutadiene | 50.0 | 0.00 | U | 51.6 | 103 | 55-138 | 8 | 0-20 |
| 91-20-3 | PSD | Naphthalene | 50.0 | 0.00 | U | 49.3 | 99 | 61-131 | 3 | 0-20 |
| 87-61-6 | PSD | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 45.9 | 92 | 56-133 | 3 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WST05-15-90482PSD**
**Lab Sample ID** **1203205737**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:32**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-82-1 | PSD | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 44.9 | 90 | 56-131 | 1 | 0-20 |
| 630-20-6 | PSD | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 53.8 | 108 | 76-129 | 3 | 0-20 |
| 95-50-1 | PSD | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 43.6 | 87 | 69-119 | 1 | 0-20 |
| 71-36-3 | PSD | n-Butyl alcohol | 5000 | 112 | | 4970 | 97 | 55-141 | 5 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WST05-15-90482PS**
**Lab Sample ID** **1203205736**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 03:05**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PS | Acrolein | 250 | 0.00 | U | 196 | 78 | 48-138 |
| 76-13-1 | PS | Trichlorotrifluoroethane | 250 | 0.00 | U | 276 | 111 | 63-146 |
| 107-05-1 | PS | Allyl chloride | 250 | 0.00 | U | 214 | 85 | 61-126 |
| 107-13-1 | PS | Acrylonitrile | 250 | 0.00 | U | 217 | 87 | 62-128 |
| 107-12-0 | PS | Propionitrile | 250 | 0.00 | U | 224 | 90 | 63-133 |
| 126-98-7 | PS | Methacrylonitrile | 250 | 0.00 | U | 224 | 89 | 61-131 |
| 80-62-6 | PS | Methyl methacrylate | 250 | 0.00 | U | 253 | 101 | 69-127 |
| 97-63-2 | PS | Ethyl methacrylate | 250 | 0.00 | U | 224 | 90 | 70-126 |
| 78-83-1 | PS | Isobutyl alcohol | 2500 | 500 | | 3350 | 114 | 57-139 |
| 126-99-8 | PS | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 50.4 | 101 | 56-140 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WST05-15-90482PSD**
**Lab Sample ID** **1203205738**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 03:37**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PSD | Acrolein | 250 | 0.00 | U | 189 | 76 | 48-138 | 3 | 0-20 |
| 76-13-1 | PSD | Trichlorotrifluoroethane | 250 | 0.00 | U | 273 | 109 | 63-146 | 1 | 0-20 |
| 107-05-1 | PSD | Allyl chloride | 250 | 0.00 | U | 209 | 83 | 61-126 | 2 | 0-20 |
| 107-13-1 | PSD | Acrylonitrile | 250 | 0.00 | U | 211 | 85 | 62-128 | 3 | 0-20 |
| 107-12-0 | PSD | Propionitrile | 250 | 0.00 | U | 221 | 89 | 63-133 | 1 | 0-20 |
| 126-98-7 | PSD | Methacrylonitrile | 250 | 0.00 | U | 216 | 86 | 61-131 | 4 | 0-20 |
| 80-62-6 | PSD | Methyl methacrylate | 250 | 0.00 | U | 240 | 96 | 69-127 | 5 | 0-20 |
| 97-63-2 | PSD | Ethyl methacrylate | 250 | 0.00 | U | 212 | 85 | 70-126 | 5 | 0-20 |
| 78-83-1 | PSD | Isobutyl alcohol | 2500 | 500 | | 3230 | 109 | 57-139 | 4 | 0-20 |
| 126-99-8 | PSD | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 49.1 | 98 | 56-140 | 3 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209451**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 22:12**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 81.0 | 81 | 78-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 846 | 68 | 60-124 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 268 | 107 | 55-147 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 267 | 107 | 72-126 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 208 | 83 | 73-135 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 213 | 85 | 61-133 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 211 | 84 | 57-145 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 182 | 73 | 67-128 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 182 | 73 | 59-147 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 54.8 | 110 | 52-134 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 40.3 | 81 | 57-126 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 44.5 | 89 | 62-126 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 56.5 | 113 | 63-127 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 40.5 | 81 | 69-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 59.3 | 119 | 69-129 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 45.6 | 91 | 72-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 43.6 | 87 | 70-127 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 41.9 | 84 | 70-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 51.2 | 102 | 74-120 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 42.2 | 84 | 73-120 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 42.0 | 84 | 75-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 46.2 | 92 | 76-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209451**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 22:12**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 50.3 | 101 | 76-131 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 55.9 | 112 | 76-122 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 51.0 | 102 | 76-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 56.3 | 113 | 76-131 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 43.3 | 87 | 73-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 58.4 | 117 | 76-135 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 54.8 | 110 | 71-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 39.9 | 80 | 75-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 47.7 | 95 | 77-123 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 38.5 | 77 | 76-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 52.8 | 106 | 77-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 55.3 | 111 | 78-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 48.5 | 97 | 78-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 38.9 | 78 | 75-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 47.6 | 95 | 78-124 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 41.9 | 84 | 76-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 43.0 | 86 | 73-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 48.1 | 96 | 73-125 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 58.2 | 116 | 72-131 |
| 106-93-4 | LCS | 1,2-Dibromoethane | 50.0 | 0.0 | 48.7 | 97 | 79-120 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 43.0 | 86 | 77-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 41.9 | 84 | 77-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209451**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 22:12**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 42.7 | 85 | 78-120 |
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 43.4 | 87 | 79-124 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 60.8 | 122 | 65-132 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 39.9 | 80 | 76-123 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 41.0 | 82 | 72-122 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 48.8 | 98 | 71-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 45.5 | 91 | 76-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 35.0 | 70 * | 75-121 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 41.2 | 82 | 77-122 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 41.3 | 83 | 76-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 39.5 | 79 | 76-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 43.4 | 87 | 77-127 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 40.4 | 81 | 77-121 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 41.6 | 83 | 77-124 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 42.3 | 85 | 77-126 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 43.8 | 88 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 45.0 | 90 | 76-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 40.2 | 80 | 76-127 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 50.0 | 0.0 | 55.7 | 111 | 60-130 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 56.3 | 113 | 69-133 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 53.6 | 107 | 67-129 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 52.5 | 105 | 66-131 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209451**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 22:12**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 50.8 | 102 | 68-132 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 53.3 | 107 | 80-126 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 46.3 | 93 | 77-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4740 | 95 | 61-135 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209452**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 23:18**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 201 | 81 | 61-132 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 272 | 109 | 67-139 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 194 | 77 | 64-124 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 208 | 83 | 68-123 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 218 | 87 | 69-128 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 216 | 87 | 66-124 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 244 | 98 | 73-123 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 221 | 88 | 75-122 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 2810 | 112 | 64-132 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 48.9 | 98 | 60-137 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1434601** | **Instrument ID:** | **VOA1.I** | **Data File:** | **111014V1\1I109BAR.D** |
| **Lab Sample ID:** | **1203205732** | **Prep Date:** | **11/10/2014 13:10** | **Analyzed:** | **11/10/14 13:10** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1434601 | 1203205733 | 111014V1\1I104LAB.D | 11/10/14 | 1026 |
| 02 LCS for batch 1434601 | 1203205734 | 111014V1\1I107BAR.D | 11/10/14 | 1205 |
| 03 CAWR-14-89227 | 360220008 | 111014V1\1I112.D | 11/10/14 | 1449 |
| 04 CAWR-14-89231 | 360220006 | 111014V1\1I118.D | 11/10/14 | 1807 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1434601** | **Instrument ID:** | **VOA1.I** | **Data File:** | **111314V1\1I428BA.D** |
| **Lab Sample ID:** | **1203209450** | **Prep Date:** | **11/13/2014 23:50** | **Analyzed:** | **11/13/14 23:50** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 06 LCS for batch 1434601 | 1203209451 | 111314V1\1I425LA.D | 11/13/14 | 2212 |
| 07 LCS for batch 1434601 | 1203209452 | 111314V1\1I427LA.D | 11/13/14 | 2318 |
| 08 WST05-15-90482PS | 1203205735 | 111314V1\1I432.D | 11/14/14 | 0200 |
| 09 WST05-15-90482PSD | 1203205737 | 111314V1\1I433.D | 11/14/14 | 0232 |
| 10 WST05-15-90482PS | 1203205736 | 111314V1\1I434.D | 11/14/14 | 0305 |
| 11 WST05-15-90482PSD | 1203205738 | 111314V1\1I435.D | 11/14/14 | 0337 |

# Quality Control Data

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205732** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 13:10** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 13:10** | | | | |
| **Data File:** | **111014V1\1I109BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205732** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 13:10** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 13:10** | | | | |
| **Data File:** | **111014V1\1I109BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205732** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 13:10** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 13:10** | | | | |
| **Data File:** | **111014V1\1I109BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 49.9 | 50.0 | ug/L | 99.9 | (77%-123%) |
| Bromofluorobenzene | 43.6 | 50.0 | ug/L | 87.2 | (80%-120%) |
| Toluene-d8 | 46.6 | 50.0 | ug/L | 93.2 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205733** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 10:26** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 10:26** | | | | |
| **Data File:** | **111014V1\1I104LAB.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 58.2 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 64.0 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 46.3 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 47.4 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 50.8 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 55.0 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 52.6 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 55.1 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 50.2 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 54.3 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 48.8 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 53.1 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 52.1 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 50.6 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 55.1 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 45.3 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 50.0 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 50.4 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 46.3 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 50.4 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 61.8 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 227 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 50.8 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 206 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 47.7 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 52.7 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 209 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 258 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 991 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 48.8 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 57.3 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 55.9 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 62.4 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205733** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 10:26** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 10:26** | | | | |
| **Data File:** | **111014V1\1I104LAB.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 56.8 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 262 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 66.8 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 47.6 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 55.7 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 47.3 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 61.4 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 69.4 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 48.2 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 51.1 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 60.3 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 285 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 50.1 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 47.1 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 52.4 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 49.9 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 57.5 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 48.4 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 57.0 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 65.0 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 231 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 52.7 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 52.9 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 53.9 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 101 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4940 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 49.0 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 47.0 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 50.4 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 51.5 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205733** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 10:26** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 10:26** | | | | |
| **Data File:** | **111014V1\1I104LAB.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 50.4 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 52.0 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 51.4 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 54.2 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.1 | 50.0 | ug/L | 96.2 | (77%-123%) |
| Bromofluorobenzene | 42.3 | 50.0 | ug/L | 84.5 | (80%-120%) |
| Toluene-d8 | 45.0 | 50.0 | ug/L | 89.9 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205734** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 12:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 12:05** | | | | |
| **Data File:** | **111014V1\1I107BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 60.0 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 248 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 246 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 242 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205734** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 12:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 12:05** | | | | |
| **Data File:** | **111014V1\1I107BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 236 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 3090 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 243 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 263 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 253 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 333 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205734** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 12:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 12:05** | | | | |
| **Data File:** | **111014V1\1I107BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.2 | 50.0 | ug/L | 100 | (77%-123%) |
| Bromofluorobenzene | 42.8 | 50.0 | ug/L | 85.7 | (80%-120%) |
| Toluene-d8 | 45.8 | 50.0 | ug/L | 91.6 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205735** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:00** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:00** | | | | |
| **Data File:** | **111314V1\1I432.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 52.4 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 52.7 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 41.5 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 40.9 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 41.1 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 41.5 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 40.8 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 44.6 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 50.7 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 44.7 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 36.8 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 55.0 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 47.0 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 43.0 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 53.7 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 37.1 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 38.7 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 40.7 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 41.9 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 40.1 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 46.5 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 169 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 38.1 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 139 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 35.6 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 38.8 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 182 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 336 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 812 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 39.2 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 44.2 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 54.6 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 59.7 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205735** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:00** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:00** | | | | |
| **Data File:** | **111314V1\1I432.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 48.3 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 198 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 55.8 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 41.2 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 35.4 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 49.5 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 34.9 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 57.3 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 50.3 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 45.0 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 41.0 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 38.8 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 47.8 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 264 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 38.6 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 40.6 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 48.1 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 40.5 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 45.3 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 38.3 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 46.0 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 52.5 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 170 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 38.2 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 45.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 44.3 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 79.3 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4710 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 35.7 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 33.4 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 40.3 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 37.9 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205735** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:00** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:00** | | | | |
| **Data File:** | **111314V1\1I432.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 45.2 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 40.5 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 40.7 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 44.7 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 49.7 | 50.0 | ug/L | 99.3 | (77%-123%) |
| Bromofluorobenzene | 43.3 | 50.0 | ug/L | 86.6 | (80%-120%) |
| Toluene-d8 | 44.3 | 50.0 | ug/L | 88.6 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205736** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:05** | | | | |
| **Data File:** | **111314V1\1I434.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 50.4 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 196 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 217 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 214 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205736** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:05** | | | | |
| **Data File:** | **111314V1\1I434.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 224 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 3350 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 224 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 253 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 224 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 276 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205736** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:05** | | | | |
| **Data File:** | **111314V1\1I434.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 49.0 | 50.0 | ug/L | 97.9 | (77%-123%) |
| Bromofluorobenzene | 43.9 | 50.0 | ug/L | 87.7 | (80%-120%) |
| Toluene-d8 | 44.2 | 50.0 | ug/L | 88.3 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205737** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:32** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:32** | | | | |
| **Data File:** | **111314V1\1I433.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 53.8 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 58.1 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 42.1 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 42.3 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 44.3 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 44.5 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 45.0 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 45.9 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 50.3 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 44.9 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 39.4 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 57.1 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 48.0 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 43.6 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 55.9 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 40.3 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 41.4 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 41.4 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 41.7 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 41.9 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 49.8 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 184 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 41.0 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 136 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 38.2 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 41.9 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 182 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 365 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 894 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 41.7 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 44.9 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 57.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 56.2 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 60.4 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205737** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:32** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:32** | | | | |
| **Data File:** | **111314V1\1I433.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 50.8 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 216 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 60.9 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 42.9 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 37.6 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 53.0 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 36.0 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 59.1 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 53.8 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 44.5 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 44.0 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 41.6 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 51.6 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 284 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 39.8 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 43.4 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 49.3 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 41.7 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 46.7 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 39.7 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 48.2 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 182 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 38.7 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 49.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 48.5 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 82.2 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4970 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 38.6 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 36.4 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 41.7 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 41.1 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205737** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:32** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:32** | | | | |
| **Data File:** | **111314V1\1I433.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 48.6 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 43.6 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 43.3 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 46.3 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.3 | 50.0 | ug/L | 107 | (77%-123%) |
| Bromofluorobenzene | 43.4 | 50.0 | ug/L | 86.9 | (80%-120%) |
| Toluene-d8 | 44.7 | 50.0 | ug/L | 89.4 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205738** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:37** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:37** | | | | |
| **Data File:** | **111314V1\1I435.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 49.1 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 189 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 211 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 209 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205738** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:37** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:37** | | | | |
| **Data File:** | **111314V1\1I435.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 212 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 3230 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 216 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 240 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 221 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 273 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205738** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:37** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:37** | | | | |
| **Data File:** | **111314V1\1I435.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.6 | 50.0 | ug/L | 97.2 | (77%-123%) |
| Bromofluorobenzene | 43.4 | 50.0 | ug/L | 86.9 | (80%-120%) |
| Toluene-d8 | 43.8 | 50.0 | ug/L | 87.5 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209450** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:50** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:50** | | | | |
| **Data File:** | **111314V1\1I428BA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209450** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:50** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:50** | | | | |
| **Data File:** | **111314V1\1I428BA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209450** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:50** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:50** | | | | |
| **Data File:** | **111314V1\1I428BA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 51.8 | 50.0 | ug/L | 104 | (77%-123%) |
| Bromofluorobenzene | 43.5 | 50.0 | ug/L | 87.1 | (80%-120%) |
| Toluene-d8 | 44.5 | 50.0 | ug/L | 89.0 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209451** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 22:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 22:12** | | | | |
| **Data File:** | **111314V1\1I425LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 53.3 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 56.3 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 41.0 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 41.9 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 42.0 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 43.6 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 43.3 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 52.5 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 48.8 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 50.8 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 40.4 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 55.7 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | | 48.7 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 46.3 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 54.8 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 38.5 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 41.2 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 43.8 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 43.0 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 45.0 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 50.3 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 211 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 41.3 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 182 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 39.5 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 42.3 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 182 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 268 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 846 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 39.9 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 45.5 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 55.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 55.3 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 60.8 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209451** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 22:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 22:12** | | | | |
| **Data File:** | **111314V1\1I425LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | | 56.5 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 208 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | | 58.4 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 43.0 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 40.5 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 51.0 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 40.3 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 58.2 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 52.8 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 54.8 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 45.6 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 41.9 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 56.3 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 267 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 39.9 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 41.9 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 53.6 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 43.4 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 48.1 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 38.9 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 47.7 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 59.3 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 213 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 44.5 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 46.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 48.5 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 81.0 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4740 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 40.2 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 35.0 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 42.7 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 41.6 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209451** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 22:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 22:12** | | | | |
| **Data File:** | **111314V1\1I425LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | | 51.2 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 43.4 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | | 42.2 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 47.6 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.3 | 50.0 | ug/L | 105 | (77%-123%) |
| Bromofluorobenzene | 43.1 | 50.0 | ug/L | 86.1 | (80%-120%) |
| Toluene-d8 | 44.0 | 50.0 | ug/L | 87.9 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209452** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:18** | | | | |
| **Data File:** | **111314V1\1I427LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 1.00 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 48.9 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 201 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 208 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 194 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209452** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:18** | | | | |
| **Data File:** | **111314V1\1I427LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 221 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2810 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 216 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 244 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 218 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 272 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209452** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:18** | | | | |
| **Data File:** | **111314V1\1I427LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 51.1 | 50.0 | ug/L | 102 | (77%-123%) |
| Bromofluorobenzene | 42.7 | 50.0 | ug/L | 85.3 | (80%-120%) |
| Toluene-d8 | 44.0 | 50.0 | ug/L | 88.1 | (80%-120%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 15-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| VOA GC/MS | SW846 8260B DOE-AL | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1434601 | See Below | | |

**Potentially affected work order(s)(SDG):** **360220(2015-187),360285(2015-188),360424(2015-204),360425(2015-207),360431(2015-208),360697(2015-222),360759(2015-237)**

**Application Issues:**

Failed Recovery for LCS/LCSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. QC sample 1203205733LCS has unacceptable spike recoveries for Trichlorofluoromethane (130%, limits 69.00%-129.00%), and Dichlorodifluoromethane (139%, limits 52.00%-134.00%).<br><br>QC sample 1203205744LCS has unacceptable spike recovery for Carbon tetrachloride (136%, limits 76.00%-135.00%).<br><br>QC sample 1203209451LCS has unacceptable spike recovery for n-Propylbenzene (69.9%, limits 75.00%-121.00%). | 1. The LCS recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. |

**Originator's Name:**

Vanny Yib 15-NOV-14

**Data Validator/Group Leader:**

Kelle Bellamy 19-NOV-14

# Semi-Volatile Analysis

# Case Narrative

**Semi-Volatile Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-187**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry** |
| Analytical Method: | SW846 3510C/8270D |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1433097 |
| Prep Batch Number: | 1433096 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

| Sample ID | Client ID |
|---|---|
| 360220002 | CAWR-14-89228 |
| 360220006 | CAWR-14-89231 |
| 1203201872 | MB for batch 1433096 |
| 1203201873 | Laboratory Control Sample (LCS) |
| 1203201874 | 360288006(WSTMO-14-86605) Matrix Spike (MS) |
| 1203201875 | 360288006(WSTMO-14-86605) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 33.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in

the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

**CCV Requirements**
All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D for samples 360220002 (CAWR-14-89228) and 360220006 (CAWR-14-89231) and the associated QC. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. Detected concentrations of these analytes should be considered as estimated.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG in this batch met the acceptance criteria.

**Surrogate Recoveries**
Samples 1203201874 (WSTMO-14-86605MS) and 1203201875 (WSTMO-14-86605MSD) displayed surrogate recovery failures. Please see the QC Summary/Surrogate Recovery Report for specific failures. Since the parent sample and associated MS/MSD pair displayed similar recoveries, the failures were attributed to matrix interference and the data results are reported.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Sample 360288006 (WSTMO-14-86605) was selected for analysis as the matrix spike and matrix spike duplicate.

**Matrix Spike (MS) Recovery Statement**
The MS, 1203201874 (WSTMO-14-86605MS), recovered spiked analytes outside of their established acceptance limits. Please see the QC Summary/Spike Recovery Report for the specific failures. As similar recoveries were displayed in the MS and MSD, the failures were attributed to sample matrix interference and the data are reported.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD, 1203201875 (WSTMO-14-86605MSD), recovered spiked analytes outside of their established acceptance limits. Please see the QC Summary/Spike Recovery Report for the specific failures. As similar recoveries were displayed in the MS and MSD, the failures were attributed to sample matrix interference and the data are reported.

**MS/MSD Relative Percent Difference (RPD) Statement**
The relative percent differences (RPD) for the MS and MSD, 1203201874 (WSTMO-14-86605MS) and 1203201875 (WSTMO-14-86605MSD), were not within the acceptance limits. The failures were attributed to matrix interference. The data are reported.

**Internal Standard (ISTD) Acceptance**
Samples 1203201874 (WSTMO-14-86605MS) and 1203201875 (WSTMO-14-86605MSD) failed ISTD acceptance criteria. Since the MS and MSD displayed similar responses to the associated parent sample, the failures were attributed to matrix interference. The data are reported.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception report 1352343 was generated for the samples in this batch for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for samples 1203201872 (MB), 360220002 (CAWR-14-89228) and 360220006 (CAWR-14-89231) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and

inserted into the electronic package.

**System Configuration**

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| MSD3.I | Agilent 7890A/5975C GC/MS w/ 7683 Autosampler | HP7890A/HP5975C | DB-5MS | 25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-187 GEL Work Order: 360220

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

E Concentration of the target analyte exceeds the instrument calibration range

J Value is estimated

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey **Name: Barbara Bailey**

**Date: 19 NOV 2014** **Title: Data Validator**

# Sample Data Summary

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 13:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220002** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **SVOC** | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89228** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 14:00** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0406.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 122-66-7 | Azobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 123-91-1 | 1,4-Dioxane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 90-12-0 | 1-Methylnaphthalene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.8 | ug/L | 5.21 | 20.8 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.04 | ug/L | 0.427 | 1.04 |
| 95-57-8 | 2-Chlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-57-6 | 2-Methylnaphthalene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 88-75-5 | 2-Nitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 59-50-7 | Parachlorometa cresol | U | 10.4 | ug/L | 3.13 | 10.4 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.4 | ug/L | 3.44 | 10.4 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 100-02-7 | 4-Nitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 83-32-9 | Acenaphthene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 208-96-8 | Acenaphthylene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 62-53-3 | Aniline | U | 10.4 | ug/L | 4.38 | 10.4 |
| 120-12-7 | Anthracene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 1912-24-9 | Atrazine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 92-87-5 | Benzidine | U | 10.4 | ug/L | 4.06 | 10.4 |
| 56-55-3 | Benzo(a)anthracene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 50-32-8 | Benzo(a)pyrene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 205-99-2 | Benzo(b)fluoranthene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 191-24-2 | Benzo(ghi)perylene | U | 1.04 | ug/L | 0.313 | 1.04 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 13:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220002** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **SVOC** | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89228** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 14:00** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0406.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 65-85-0 | Benzoic acid | U | 20.8 | ug/L | 6.25 | 20.8 |
| 100-51-6 | Benzyl alcohol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 85-68-7 | Butylbenzylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 218-01-9 | Chrysene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 84-74-2 | Di-n-butylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 117-84-0 | Di-n-octylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 132-64-9 | Dibenzofuran | U | 10.4 | ug/L | 3.13 | 10.4 |
| 84-66-2 | Diethylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 131-11-3 | Dimethylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-85-7 | Dinoseb | U | 10.4 | ug/L | 3.13 | 10.4 |
| 122-39-4 | Diphenylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 206-44-0 | Fluoranthene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 86-73-7 | Fluorene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 118-74-1 | Hexachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 87-68-3 | Hexachlorobutadiene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 67-72-1 | Hexachloroethane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 78-59-1 | Isophorone | U | 10.4 | ug/L | 3.65 | 10.4 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-20-3 | Naphthalene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 98-95-3 | Nitrobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 608-93-5 | Pentachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 87-86-5 | Pentachlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 85-01-8 | Phenanthrene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 108-95-2 | Phenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 129-00-0 | Pyrene | U | 1.04 | ug/L | 0.313 | 1.04 |
| 110-86-1 | Pyridine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.4 | ug/L | 3.13 | 10.4 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 13:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220002** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **SVOC** | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89228** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 14:00** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0406.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | U | 10.4 | ug/L | 3.85 | 10.4 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-48-7 | o-Cresol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 57.1 | 104 | ug/L | 54.8 | (33%-126%) |
| 2-Fluorobiphenyl | 35.8 | 52.1 | ug/L | 68.8 | (35%-102%) |
| 2-Fluorophenol | 33.2 | 104 | ug/L | 31.9 | (18%-84%) |
| Nitrobenzene-d5 | 33.3 | 52.1 | ug/L | 63.9 | (38%-113%) |
| Phenol-d5 | 20.7 | 104 | ug/L | 19.8 | (10%-110%) |
| p-Terphenyl-d14 | 42.9 | 52.1 | ug/L | 82.3 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000067-66-3 | Trichloromethane | 2.103 | 43.4 | ug/L | 94 | NJ |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220006** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89231** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 14:29** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **990 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0407.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 122-66-7 | Azobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 123-91-1 | 1,4-Dioxane | U | 10.1 | ug/L | 3.03 | 10.1 |
| 90-12-0 | 1-Methylnaphthalene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.2 | ug/L | 5.05 | 20.2 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.01 | ug/L | 0.414 | 1.01 |
| 95-57-8 | 2-Chlorophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 91-57-6 | 2-Methylnaphthalene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 88-75-5 | 2-Nitrophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.1 | ug/L | 3.03 | 10.1 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.1 | ug/L | 3.03 | 10.1 |
| 59-50-7 | Parachlorometa cresol | U | 10.1 | ug/L | 3.03 | 10.1 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.1 | ug/L | 3.33 | 10.1 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.1 | ug/L | 3.03 | 10.1 |
| 100-02-7 | 4-Nitrophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 83-32-9 | Acenaphthene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 208-96-8 | Acenaphthylene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 62-53-3 | Aniline | U | 10.1 | ug/L | 4.24 | 10.1 |
| 120-12-7 | Anthracene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 1912-24-9 | Atrazine | U | 10.1 | ug/L | 3.03 | 10.1 |
| 92-87-5 | Benzidine | U | 10.1 | ug/L | 3.94 | 10.1 |
| 56-55-3 | Benzo(a)anthracene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 50-32-8 | Benzo(a)pyrene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 205-99-2 | Benzo(b)fluoranthene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 191-24-2 | Benzo(ghi)perylene | U | 1.01 | ug/L | 0.303 | 1.01 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220006** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89231** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 14:29** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **990 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0407.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 65-85-0 | Benzoic acid | U | 20.2 | ug/L | 6.06 | 20.2 |
| 100-51-6 | Benzyl alcohol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 85-68-7 | Butylbenzylphthalate | U | 10.1 | ug/L | 3.03 | 10.1 |
| 218-01-9 | Chrysene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 84-74-2 | Di-n-butylphthalate | U | 10.1 | ug/L | 3.03 | 10.1 |
| 117-84-0 | Di-n-octylphthalate | U | 10.1 | ug/L | 3.03 | 10.1 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 132-64-9 | Dibenzofuran | U | 10.1 | ug/L | 3.03 | 10.1 |
| 84-66-2 | Diethylphthalate | U | 10.1 | ug/L | 3.03 | 10.1 |
| 131-11-3 | Dimethylphthalate | U | 10.1 | ug/L | 3.03 | 10.1 |
| 88-85-7 | Dinoseb | U | 10.1 | ug/L | 3.03 | 10.1 |
| 122-39-4 | Diphenylamine | U | 10.1 | ug/L | 3.03 | 10.1 |
| 206-44-0 | Fluoranthene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 86-73-7 | Fluorene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 118-74-1 | Hexachlorobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 87-68-3 | Hexachlorobutadiene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 67-72-1 | Hexachloroethane | U | 10.1 | ug/L | 3.03 | 10.1 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 78-59-1 | Isophorone | U | 10.1 | ug/L | 3.54 | 10.1 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.1 | ug/L | 3.03 | 10.1 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.1 | ug/L | 3.03 | 10.1 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.1 | ug/L | 3.03 | 10.1 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.1 | ug/L | 3.03 | 10.1 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.1 | ug/L | 3.03 | 10.1 |
| 91-20-3 | Naphthalene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 98-95-3 | Nitrobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 608-93-5 | Pentachlorobenzene | U | 10.1 | ug/L | 3.03 | 10.1 |
| 87-86-5 | Pentachlorophenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 85-01-8 | Phenanthrene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 108-95-2 | Phenol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 129-00-0 | Pyrene | U | 1.01 | ug/L | 0.303 | 1.01 |
| 110-86-1 | Pyridine | U | 10.1 | ug/L | 3.03 | 10.1 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.1 | ug/L | 3.03 | 10.1 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.1 | ug/L | 3.03 | 10.1 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.1 | ug/L | 3.03 | 10.1 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.1 | ug/L | 3.03 | 10.1 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220006** | **Date Received:** | **10/31/2014 09:00** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89231** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 14:29** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **990 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0407.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | U | 10.1 | ug/L | 3.74 | 10.1 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.1 | ug/L | 3.03 | 10.1 |
| 95-48-7 | o-Cresol | U | 10.1 | ug/L | 3.03 | 10.1 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.1 | ug/L | 3.03 | 10.1 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.1 | ug/L | 3.03 | 10.1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 73.5 | 101 | ug/L | 72.8 | (33%-126%) |
| 2-Fluorobiphenyl | 36.7 | 50.5 | ug/L | 72.7 | (35%-102%) |
| 2-Fluorophenol | 32.7 | 101 | ug/L | 32.4 | (18%-84%) |
| Nitrobenzene-d5 | 33.0 | 50.5 | ug/L | 65.3 | (38%-113%) |
| Phenol-d5 | 20.5 | 101 | ug/L | 20.3 | (10%-110%) |
| p-Terphenyl-d14 | 42.0 | 50.5 | ug/L | 83.2 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000067-66-3 | Trichloromethane | 2.106 | 48.8 | ug/L | 95 | NJ |
| 007785-70-8 | 1R-.alpha.-Pinene | 5.093 | 58.3 | ug/L | 97 | NJ |
| | unknown | 14.528 | 5.38 | ug/L | 0 | J |
| | unknown | 15.278 | 7.29 | ug/L | 0 | J |

# Quality Control Summary

**Semi-Volatile**

## Surrogate Recovery Report

**SDG Number: 2015-187**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 2FP %REC | PHL %REC | NBZ %REC | FBP %REC | TBP %REC | TPH %REC |
|---|---|---|---|---|---|---|---|
| 1203201872 | MB for batch 1433096 | 48 | 30 | 85 | 90 | 80 | 91 |
| 1203201873 | LCS for batch 1433096 | 40 | 24 | 69 | 78 | 65 | 77 |
| 360220002 | CAWR-14-89228 | 32 | 20 | 64 | 69 | 55 | 82 |
| 360220006 | CAWR-14-89231 | 32 | 20 | 65 | 73 | 73 | 83 |
| 1203201874 | WSTMO-14-86605MS | 15 * | 10 | 47 | 50 | 7 * | 77 |
| 1203201875 | WSTMO-14-86605MSD | 22 | 15 | 62 | 65 | 28 * | 95 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 2FP | = 2-Fluorophenol | (18%-84%) |
| PHL | = Phenol-d5 | (10%-110%) |
| NBZ | = Nitrobenzene-d5 | (38%-113%) |
| FBP | = 2-Fluorobiphenyl | (35%-102%) |
| TBP | = 2,4,6-Tribromophenol | (33%-126%) |
| TPH | = p-Terphenyl-d14 | (38%-123%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1433096**
**Lab Sample ID** **1203201873**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/04/2014 13:31**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 62-75-9 | LCS | N-Methyl-N-nitrosomethylam | 50.0 | 0.0 | 25.3 | 51 | 24-82 |
| 110-86-1 | LCS | Pyridine | 50.0 | 0.0 | 27.2 | 54 | 24-97 |
| 62-53-3 | LCS | Aniline | 50.0 | 0.0 | 38.3 | 77 | 42-120 |
| 108-95-2 | LCS | Phenol | 50.0 | 0.0 | 14.0 | 28 | 10-114 |
| 111-44-4 | LCS | bis(2-Chloroethyl) ether | 50.0 | 0.0 | 35.1 | 70 | 44-111 |
| 95-57-8 | LCS | 2-Chlorophenol | 50.0 | 0.0 | 33.9 | 68 | 44-103 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 26.0 | 52 | 27-91 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 27.8 | 56 | 27-93 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 28.0 | 56 | 29-92 |
| 108-60-1 | LCS | bis(2-Chloro-1-methylethyl)et | 50.0 | 0.0 | 38.7 | 77 | 30-113 |
| 100-51-6 | LCS | Benzyl alcohol | 50.0 | 0.0 | 33.8 | 68 | 34-106 |
| 95-48-7 | LCS | o-Cresol | 50.0 | 0.0 | 29.9 | 60 | 36-99 |
| 65794-96-9 | LCS | m,p-Cresols | 50.0 | 0.0 | 30.6 | 61 | 34-106 |
| 621-64-7 | LCS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 50.0 | 0.0 | 36.9 | 74 | 48-119 |
| 67-72-1 | LCS | Hexachloroethane | 50.0 | 0.0 | 21.8 | 44 | 25-92 |
| 98-95-3 | LCS | Nitrobenzene | 50.0 | 0.0 | 36.4 | 73 | 44-117 |
| 78-59-1 | LCS | Isophorone | 50.0 | 0.0 | 38.4 | 77 | 49-124 |
| 88-75-5 | LCS | 2-Nitrophenol | 50.0 | 0.0 | 40.2 | 80 | 47-110 |
| 105-67-9 | LCS | 2,4-Dimethylphenol | 50.0 | 0.0 | 34.6 | 69 | 43-105 |
| 111-91-1 | LCS | bis(2-Chloroethoxy)methane | 50.0 | 0.0 | 37.4 | 75 | 48-114 |
| 120-83-2 | LCS | 2,4-Dichlorophenol | 50.0 | 0.0 | 38.1 | 76 | 47-107 |
| 65-85-0 | LCS | Benzoic acid | 100 | 0.0 | 23.5 | 23 | 10-91 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1433096**
**Lab Sample ID** **1203201873**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/04/2014 13:31**
**Dilution: 1**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-47-8 | LCS | 4-Chloroaniline | 50.0 | 0.0 | 40.5 | 81 | 48-120 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 24.4 | 49 | 24-93 |
| 59-50-7 | LCS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 50.0 | 0.0 | 36.1 | 72 | 47-113 |
| 91-57-6 | LCS | 2-Methylnaphthalene | 50.0 | 0.0 | 33.4 | 67 | 33-96 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 32.1 | 64 | 33-96 |
| 90-12-0 | LCS | 1-Methylnaphthalene | 50.0 | 0.0 | 35.6 | 71 | 34-98 |
| 77-47-4 | LCS | Hexachlorocyclopentadiene | 50.0 | 0.0 | 24.7 | 49 | 18-87 |
| 88-06-2 | LCS | 2,4,6-Trichlorophenol | 50.0 | 0.0 | 38.7 | 77 | 48-114 |
| 95-95-4 | LCS | 2,4,5-Trichlorophenol | 50.0 | 0.0 | 38.4 | 77 | 50-113 |
| 91-58-7 | LCS | 2-Chloronaphthalene | 50.0 | 0.0 | 39.3 | 79 | 37-100 |
| 88-74-4 | LCS | 2-Nitroaniline<br>*o-Nitroaniline* | 50.0 | 0.0 | 41.8 | 84 | 50-123 |
| 99-09-2 | LCS | 3-Nitroaniline<br>*m-Nitroaniline* | 50.0 | 0.0 | 39.3 | 79 | 48-126 |
| 131-11-3 | LCS | Dimethylphthalate | 50.0 | 0.0 | 43.3 | 87 | 55-119 |
| 606-20-2 | LCS | 2,6-Dinitrotoluene | 50.0 | 0.0 | 41.9 | 84 | 55-117 |
| 121-14-2 | LCS | 2,4-Dinitrotoluene | 50.0 | 0.0 | 39.2 | 78 | 55-123 |
| 208-96-8 | LCS | Acenaphthylene | 50.0 | 0.0 | 40.0 | 80 | 43-104 |
| 83-32-9 | LCS | Acenaphthene | 50.0 | 0.0 | 39.2 | 78 | 42-101 |
| 51-28-5 | LCS | 2,4-Dinitrophenol | 50.0 | 0.0 | 25.0 | 50 | 14-126 |
| 132-64-9 | LCS | Dibenzofuran | 50.0 | 0.0 | 41.6 | 83 | 46-111 |
| 58-90-2 | LCS | 2,3,4,6-Tetrachlorophenol | 50.0 | 0.0 | 29.6 | 59 | 48-117 |
| 84-66-2 | LCS | Diethylphthalate | 50.0 | 0.0 | 41.7 | 83 | 55-121 |
| 100-02-7 | LCS | 4-Nitrophenol | 50.0 | 0.0 | 10.5 | 21 | 15-109 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1433096**
**Lab Sample ID** **1203201873**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/04/2014 13:31**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 86-73-7 | LCS | Fluorene | 50.0 | 0.0 | 38.7 | 77 | 47-105 |
| 7005-72-3 | LCS | 4-Chlorophenylphenylether | 50.0 | 0.0 | 38.9 | 78 | 44-112 |
| 100-01-6 | LCS | 4-Nitroaniline<br>*p-Nitroaniline* | 50.0 | 0.0 | 41.9 | 84 | 46-144 |
| 534-52-1 | LCS | 2-Methyl-4,6-dinitrophenol | 50.0 | 0.0 | 28.4 | 57 | 41-123 |
| 122-39-4 | LCS | Diphenylamine | 50.0 | 0.0 | 53.1 | 106 | 51-111 |
| 122-66-7 | LCS | Azobenzene<br>*1,2-Diphenylhydrazine* | 50.0 | 0.0 | 46.4 | 93 | 43-114 |
| 101-55-3 | LCS | 4-Bromophenylphenylether | 50.0 | 0.0 | 47.3 | 95 | 46-112 |
| 118-74-1 | LCS | Hexachlorobenzene | 50.0 | 0.0 | 45.5 | 91 | 46-113 |
| 87-86-5 | LCS | Pentachlorophenol | 50.0 | 0.0 | 23.3 | 47 | 33-111 |
| 85-01-8 | LCS | Phenanthrene | 50.0 | 0.0 | 40.8 | 82 | 49-106 |
| 120-12-7 | LCS | Anthracene | 50.0 | 0.0 | 40.8 | 82 | 49-106 |
| 84-74-2 | LCS | Di-n-butylphthalate | 50.0 | 0.0 | 46.0 | 92 | 52-119 |
| 206-44-0 | LCS | Fluoranthene | 50.0 | 0.0 | 36.6 | 73 | 48-114 |
| 129-00-0 | LCS | Pyrene | 50.0 | 0.0 | 42.1 | 84 | 41-115 |
| 85-68-7 | LCS | Butylbenzylphthalate | 50.0 | 0.0 | 45.3 | 91 | 45-121 |
| 117-81-7 | LCS | bis(2-Ethylhexyl)phthalate | 50.0 | 0.0 | 44.4 | 89 | 43-120 |
| 56-55-3 | LCS | Benzo(a)anthracene | 50.0 | 0.0 | 41.7 | 83 | 50-107 |
| 218-01-9 | LCS | Chrysene | 50.0 | 0.0 | 42.5 | 85 | 48-108 |
| 117-84-0 | LCS | Di-n-octylphthalate | 50.0 | 0.0 | 43.8 | 88 | 40-122 |
| 205-99-2 | LCS | Benzo(b)fluoranthene | 50.0 | 0.0 | 41.4 | 83 | 48-110 |
| 207-08-9 | LCS | Benzo(k)fluoranthene | 50.0 | 0.0 | 41.5 | 83 | 48-112 |
| 50-32-8 | LCS | Benzo(a)pyrene | 50.0 | 0.0 | 42.0 | 84 | 47-106 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1433096**
**Lab Sample ID** **1203201873**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/04/2014 13:31**
**Dilution: 1**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 193-39-5 | LCS | Indeno(1,2,3-cd)pyrene | 50.0 | 0.0 | 42.5 | 85 | 37-120 |
| 53-70-3 | LCS | Dibenzo(a,h)anthracene | 50.0 | 0.0 | 54.2 | 108 | 36-124 |
| 191-24-2 | LCS | Benzo(ghi)perylene | 50.0 | 0.0 | 51.1 | 102 | 34-121 |
| 123-91-1 | LCS | 1,4-Dioxane | 50.0 | 0.0 | 22.1 | 44 | 29-74 |
| 930-55-2 | LCS | N-Nitrosopyrrolidine | 50.0 | 0.0 | 35.5 | 71 | 46-111 |
| 95-94-3 | LCS | 1,2,4,5-Tetrachlorobenzene | 50.0 | 0.0 | 37.0 | 74 | 33-94 |
| 1912-24-9 | LCS | Atrazine | 50.0 | 0.0 | 54.4 | 109 | 30-122 |
| 92-87-5 | LCS | Benzidine | 100 | 0.0 | 42.8 | 43 | 10-137 |
| 91-94-1 | LCS | 3,3'-Dichlorobenzidine | 50.0 | 0.0 | 38.4 | 77 | 37-119 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 29.6 | 59 | 29-93 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MS**
**Lab Sample ID** **1203201874**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/04/2014 15:56**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 123-91-1 | MS | 1,4-Dioxane | 100 | 8.08 | J | 37.8 | 30 | 27-94 |
| 62-75-9 | MS | N-Methyl-N-nitrosomethylam | 100 | 0.00 | U | 35.7 | 36 | 26-97 |
| 110-86-1 | MS | Pyridine | 100 | 0.00 | U | 46.8 | 47 | 20-112 |
| 62-53-3 | MS | Aniline | 100 | 0.00 | U | 49.6 | 50 | 28-126 |
| 108-95-2 | MS | Phenol | 100 | 0.00 | U | 11.9 | 12 * | 17-77 |
| 111-44-4 | MS | bis(2-Chloroethyl) ether | 100 | 0.00 | U | 50.8 | 51 | 37-113 |
| 95-57-8 | MS | 2-Chlorophenol | 100 | 0.00 | U | 27.4 | 27 * | 34-108 |
| 541-73-1 | MS | 1,3-Dichlorobenzene | 100 | 0.00 | U | 42.2 | 42 | 25-89 |
| 106-46-7 | MS | 1,4-Dichlorobenzene | 100 | 0.00 | U | 44.6 | 45 | 26-90 |
| 95-50-1 | MS | 1,2-Dichlorobenzene | 100 | 0.00 | U | 45.2 | 45 | 26-92 |
| 108-60-1 | MS | bis(2-Chloro-1-methylethyl)et | 100 | 0.00 | U | 55.1 | 55 | 26-114 |
| 100-51-6 | MS | Benzyl alcohol | 100 | 0.00 | U | 52.9 | 53 | 28-119 |
| 95-48-7 | MS | o-Cresol | 100 | 0.00 | U | 31.2 | 31 | 30-108 |
| 65794-96-9 | MS | m,p-Cresols | 100 | 0.00 | U | 31.2 | 31 | 31-119 |
| 621-64-7 | MS | N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine* | 100 | 0.00 | U | 54.6 | 55 | 40-122 |
| 67-72-1 | MS | Hexachloroethane | 100 | 0.00 | U | 25.9 | 26 | 23-89 |
| 98-95-3 | MS | Nitrobenzene | 100 | 0.00 | U | 49.5 | 50 | 38-123 |
| 78-59-1 | MS | Isophorone | 100 | 0.00 | U | 53.5 | 54 | 40-127 |
| 88-75-5 | MS | 2-Nitrophenol | 100 | 0.00 | U | 6.24 | 6 * | 35-116 |
| 105-67-9 | MS | 2,4-Dimethylphenol | 100 | 0.00 | U | 45.1 | 45 | 34-109 |
| 111-91-1 | MS | bis(2-Chloroethoxy)methane | 100 | 0.00 | U | 53.4 | 53 | 41-116 |
| 120-83-2 | MS | 2,4-Dichlorophenol | 100 | 0.00 | U | 29.5 | 29 * | 35-113 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MS**
**Lab Sample ID** **1203201874**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/04/2014 15:56**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 65-85-0 | MS | Benzoic acid | 200 | 0.00 | U | 29.6 | 15 | 12-94 |
| 106-47-8 | MS | 4-Chloroaniline | 100 | 0.00 | U | 46.1 | 46 | 32-122 |
| 87-68-3 | MS | Hexachlorobutadiene | 100 | 0.00 | U | 41.7 | 42 | 23-90 |
| 59-50-7 | MS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 100 | 0.00 | U | 33.6 | 34 * | 37-119 |
| 91-57-6 | MS | 2-Methylnaphthalene | 100 | 0.00 | U | 48.3 | 48 | 28-102 |
| 91-20-3 | MS | Naphthalene | 100 | 0.00 | U | 48.6 | 49 | 27-101 |
| 90-12-0 | MS | 1-Methylnaphthalene | 100 | 0.00 | U | 51.8 | 52 | 28-105 |
| 77-47-4 | MS | Hexachlorocyclopentadiene | 100 | 0.00 | U | 0.00 | 0 * | 10-84 |
| 88-06-2 | MS | 2,4,6-Trichlorophenol | 100 | 0.00 | U | 17.2 | 17 * | 36-120 |
| 95-95-4 | MS | 2,4,5-Trichlorophenol | 100 | 0.00 | U | 20.2 | 20 * | 37-121 |
| 91-58-7 | MS | 2-Chloronaphthalene | 100 | 0.00 | U | 53.7 | 54 | 32-103 |
| 88-74-4 | MS | 2-Nitroaniline<br>*o-Nitroaniline* | 100 | 0.00 | U | 51.0 | 51 | 38-126 |
| 99-09-2 | MS | 3-Nitroaniline<br>*m-Nitroaniline* | 100 | 0.00 | U | 41.8 | 42 | 30-131 |
| 131-11-3 | MS | Dimethylphthalate | 100 | 0.00 | U | 61.0 | 61 | 45-121 |
| 606-20-2 | MS | 2,6-Dinitrotoluene | 100 | 0.00 | U | 25.6 | 26 * | 44-120 |
| 121-14-2 | MS | 2,4-Dinitrotoluene | 100 | 0.00 | U | 20.8 | 21 * | 44-127 |
| 208-96-8 | MS | Acenaphthylene | 100 | 0.00 | U | 54.0 | 54 | 33-110 |
| 83-32-9 | MS | Acenaphthene | 100 | 0.00 | U | 50.1 | 50 | 31-108 |
| 51-28-5 | MS | 2,4-Dinitrophenol | 100 | 0.00 | U | 0.00 | 0 * | 10-133 |
| 132-64-9 | MS | Dibenzofuran | 100 | 0.00 | U | 56.5 | 57 | 39-114 |
| 58-90-2 | MS | 2,3,4,6-Tetrachlorophenol | 100 | 0.00 | U | 0.00 | 0 * | 34-125 |
| 84-66-2 | MS | Diethylphthalate | 100 | 0.00 | U | 57.5 | 58 | 44-124 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MS**
**Lab Sample ID** **1203201874**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/04/2014 15:56**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 100-02-7 | MS | 4-Nitrophenol | 100 | 0.00 | U | 0.00 | 0 * | 10-83 |
| 86-73-7 | MS | Fluorene | 100 | 0.00 | U | 52.4 | 52 | 36-111 |
| 7005-72-3 | MS | 4-Chlorophenylphenylether | 100 | 0.00 | U | 50.3 | 50 | 37-112 |
| 100-01-6 | MS | 4-Nitroaniline<br>*p-Nitroaniline* | 100 | 0.00 | U | 54.8 | 55 | 27-149 |
| 534-52-1 | MS | 2-Methyl-4,6-dinitrophenol | 100 | 0.00 | U | 0.00 | 0 * | 28-131 |
| 122-39-4 | MS | Diphenylamine | 100 | 0.00 | U | 64.1 | 64 | 34-117 |
| 122-66-7 | MS | Azobenzene<br>*1,2-Diphenylhydrazine* | 100 | 0.00 | U | 54.4 | 54 | 36-115 |
| 101-55-3 | MS | 4-Bromophenylphenylether | 100 | 0.00 | U | 53.8 | 54 | 39-112 |
| 118-74-1 | MS | Hexachlorobenzene | 100 | 0.00 | U | 51.5 | 52 | 39-114 |
| 87-86-5 | MS | Pentachlorophenol | 100 | 0.00 | U | 0.00 | 0 * | 24-122 |
| 85-01-8 | MS | Phenanthrene | 100 | 0.00 | U | 50.7 | 51 | 37-112 |
| 120-12-7 | MS | Anthracene | 100 | 0.00 | U | 51.8 | 52 | 36-114 |
| 84-74-2 | MS | Di-n-butylphthalate | 100 | 0.00 | U | 51.9 | 52 | 40-122 |
| 206-44-0 | MS | Fluoranthene | 100 | 0.00 | U | 37.3 | 37 | 35-118 |
| 129-00-0 | MS | Pyrene | 100 | 0.00 | U | 89.0 | 89 | 32-121 |
| 85-68-7 | MS | Butylbenzylphthalate | 100 | 0.00 | U | 67.0 | 67 | 36-124 |
| 56-55-3 | MS | Benzo(a)anthracene | 100 | 0.00 | U | 48.9 | 49 | 38-113 |
| 218-01-9 | MS | Chrysene | 100 | 0.00 | U | 50.6 | 51 | 37-114 |
| 117-84-0 | MS | Di-n-octylphthalate | 100 | 0.00 | U | 37.9 | 38 | 32-124 |
| 205-99-2 | MS | Benzo(b)fluoranthene | 100 | 0.00 | U | 51.3 | 51 | 38-116 |
| 207-08-9 | MS | Benzo(k)fluoranthene | 100 | 0.00 | U | 54.9 | 55 | 39-117 |
| 50-32-8 | MS | Benzo(a)pyrene | 100 | 0.00 | U | 49.8 | 50 | 37-112 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MS**
**Lab Sample ID** **1203201874**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/04/2014 15:56**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 193-39-5 | MS | Indeno(1,2,3-cd)pyrene | 100 | 0.00 | U | 49.2 | 49 | 25-122 |
| 53-70-3 | MS | Dibenzo(a,h)anthracene | 100 | 0.00 | U | 57.0 | 57 | 27-125 |
| 191-24-2 | MS | Benzo(ghi)perylene | 100 | 0.00 | U | 50.2 | 50 | 24-121 |
| 930-55-2 | MS | N-Nitrosopyrrolidine | 100 | 0.00 | U | 54.3 | 54 | 43-117 |
| 95-94-3 | MS | 1,2,4,5-Tetrachlorobenzene | 100 | 0.00 | U | 50.1 | 50 | 28-96 |
| 1912-24-9 | MS | Atrazine | 100 | 0.00 | U | 72.3 | 72 | 18-119 |
| 92-87-5 | MS | Benzidine | 200 | 0.00 | U | 0.00 | 0 * | 10-127 |
| 91-94-1 | MS | 3,3'-Dichlorobenzidine | 100 | 0.00 | U | 15.7 | 16 * | 19-120 |
| 120-82-1 | MS | 1,2,4-Trichlorobenzene | 100 | 0.00 | U | 47.3 | 47 | 26-92 |
| 117-81-7 | MS | bis(2-Ethylhexyl)phthalate | 100 | 120 | | 154 | 33 * | 35-123 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MSD**
**Lab Sample ID** **1203201875**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/04/2014 16:25**
**Dilution: 1**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 123-91-1 | MSD | 1,4-Dioxane | 100 | 8.08 | J | 46.5 | 38 | 27-94 | 21 | 0-30 |
| 62-75-9 | MSD | N-Methyl-N-nitrosomethylam | 100 | 0.00 | U | 41.9 | 42 | 26-97 | 16 | 0-30 |
| 110-86-1 | MSD | Pyridine | 100 | 0.00 | U | 53.4 | 53 | 20-112 | 13 | 0-30 |
| 62-53-3 | MSD | Aniline | 100 | 0.00 | U | 32.7 | 33 | 28-126 | 41 * | 0-30 |
| 108-95-2 | MSD | Phenol | 100 | 0.00 | U | 16.5 | 16 * | 17-77 | 32 * | 0-30 |
| 111-44-4 | MSD | bis(2-Chloroethyl) ether | 100 | 0.00 | U | 64.2 | 64 | 37-113 | 23 | 0-30 |
| 95-57-8 | MSD | 2-Chlorophenol | 100 | 0.00 | U | 41.9 | 42 | 34-108 | 42 * | 0-30 |
| 541-73-1 | MSD | 1,3-Dichlorobenzene | 100 | 0.00 | U | 55.7 | 56 | 25-89 | 28 | 0-30 |
| 106-46-7 | MSD | 1,4-Dichlorobenzene | 100 | 0.00 | U | 58.6 | 59 | 26-90 | 27 | 0-30 |
| 95-50-1 | MSD | 1,2-Dichlorobenzene | 100 | 0.00 | U | 58.2 | 58 | 26-92 | 25 | 0-30 |
| 108-60-1 | MSD | bis(2-Chloro-1-methylethyl)et | 100 | 0.00 | U | 68.5 | 68 | 26-114 | 22 | 0-30 |
| 100-51-6 | MSD | Benzyl alcohol | 100 | 0.00 | U | 61.2 | 61 | 28-119 | 15 | 0-30 |
| 95-48-7 | MSD | o-Cresol | 100 | 0.00 | U | 46.1 | 46 | 30-108 | 39 * | 0-30 |
| 65794-96-9 | MSD | m,p-Cresols | 100 | 0.00 | U | 45.3 | 45 | 31-119 | 37 * | 0-30 |
| 621-64-7 | MSD | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 100 | 0.00 | U | 66.2 | 66 | 40-122 | 19 | 0-30 |
| 67-72-1 | MSD | Hexachloroethane | 100 | 0.00 | U | 32.7 | 33 | 23-89 | 23 | 0-30 |
| 98-95-3 | MSD | Nitrobenzene | 100 | 0.00 | U | 63.8 | 64 | 38-123 | 25 | 0-30 |
| 78-59-1 | MSD | Isophorone | 100 | 0.00 | U | 68.2 | 68 | 40-127 | 24 | 0-30 |
| 88-75-5 | MSD | 2-Nitrophenol | 100 | 0.00 | U | 14.2 | 14 * | 35-116 | 78 * | 0-30 |
| 105-67-9 | MSD | 2,4-Dimethylphenol | 100 | 0.00 | U | 60.9 | 61 | 34-109 | 30 | 0-30 |
| 111-91-1 | MSD | bis(2-Chloroethoxy)methane | 100 | 0.00 | U | 68.4 | 68 | 41-116 | 25 | 0-30 |
| 120-83-2 | MSD | 2,4-Dichlorophenol | 100 | 0.00 | U | 48.3 | 48 | 35-113 | 48 * | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MSD**
**Lab Sample ID** **1203201875**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/04/2014 16:25**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 65-85-0 | MSD | Benzoic acid | 200 | 0.00 | U | 33.7 | 17 | 12-94 | 13 | 0-30 |
| 106-47-8 | MSD | 4-Chloroaniline | 100 | 0.00 | U | 31.5 | 31 * | 32-122 | 38 * | 0-30 |
| 87-68-3 | MSD | Hexachlorobutadiene | 100 | 0.00 | U | 55.3 | 55 | 23-90 | 28 | 0-30 |
| 59-50-7 | MSD | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 100 | 0.00 | U | 52.6 | 53 | 37-119 | 44 * | 0-30 |
| 91-57-6 | MSD | 2-Methylnaphthalene | 100 | 0.00 | U | 61.3 | 61 | 28-102 | 24 | 0-30 |
| 91-20-3 | MSD | Naphthalene | 100 | 0.00 | U | 62.0 | 62 | 27-101 | 24 | 0-30 |
| 90-12-0 | MSD | 1-Methylnaphthalene | 100 | 0.00 | U | 64.3 | 64 | 28-105 | 22 | 0-30 |
| 77-47-4 | MSD | Hexachlorocyclopentadiene | 100 | 0.00 | U | 11.8 | 12 | 10-84 | 200 * | 0-30 |
| 88-06-2 | MSD | 2,4,6-Trichlorophenol | 100 | 0.00 | U | 42.4 | 42 | 36-120 | 84 * | 0-30 |
| 95-95-4 | MSD | 2,4,5-Trichlorophenol | 100 | 0.00 | U | 43.1 | 43 | 37-121 | 72 * | 0-30 |
| 91-58-7 | MSD | 2-Chloronaphthalene | 100 | 0.00 | U | 69.3 | 69 | 32-103 | 25 | 0-30 |
| 88-74-4 | MSD | 2-Nitroaniline<br>*o-Nitroaniline* | 100 | 0.00 | U | 64.1 | 64 | 38-126 | 23 | 0-30 |
| 99-09-2 | MSD | 3-Nitroaniline<br>*m-Nitroaniline* | 100 | 0.00 | U | 36.9 | 37 | 30-131 | 13 | 0-30 |
| 131-11-3 | MSD | Dimethylphthalate | 100 | 0.00 | U | 79.0 | 79 | 45-121 | 26 | 0-30 |
| 606-20-2 | MSD | 2,6-Dinitrotoluene | 100 | 0.00 | U | 32.1 | 32 * | 44-120 | 22 | 0-30 |
| 121-14-2 | MSD | 2,4-Dinitrotoluene | 100 | 0.00 | U | 27.1 | 27 * | 44-127 | 26 | 0-30 |
| 208-96-8 | MSD | Acenaphthylene | 100 | 0.00 | U | 68.3 | 68 | 33-110 | 23 | 0-30 |
| 83-32-9 | MSD | Acenaphthene | 100 | 0.00 | U | 62.8 | 63 | 31-108 | 23 | 0-30 |
| 51-28-5 | MSD | 2,4-Dinitrophenol | 100 | 0.00 | U | 0.00 | 0 * | 10-133 | 0 | 0-30 |
| 132-64-9 | MSD | Dibenzofuran | 100 | 0.00 | U | 71.3 | 71 | 39-114 | 23 | 0-30 |
| 58-90-2 | MSD | 2,3,4,6-Tetrachlorophenol | 100 | 0.00 | U | 20.0 | 20 * | 34-125 | 200 * | 0-30 |
| 84-66-2 | MSD | Diethylphthalate | 100 | 0.00 | U | 73.7 | 74 | 44-124 | 25 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MSD**
**Lab Sample ID** **1203201875**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/04/2014 16:25**
**Dilution: 1**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 100-02-7 | MSD | 4-Nitrophenol | 100 | 0.00 | U | 12.1 | 12 | 10-83 | 200 * | 0-30 |
| 86-73-7 | MSD | Fluorene | 100 | 0.00 | U | 64.5 | 65 | 36-111 | 21 | 0-30 |
| 7005-72-3 | MSD | 4-Chlorophenylphenylether | 100 | 0.00 | U | 62.5 | 62 | 37-112 | 22 | 0-30 |
| 100-01-6 | MSD | 4-Nitroaniline<br>*p-Nitroaniline* | 100 | 0.00 | U | 47.9 | 48 | 27-149 | 13 | 0-30 |
| 534-52-1 | MSD | 2-Methyl-4,6-dinitrophenol | 100 | 0.00 | U | 0.00 | 0 * | 28-131 | 0 | 0-30 |
| 122-39-4 | MSD | Diphenylamine | 100 | 0.00 | U | 77.0 | 77 | 34-117 | 18 | 0-30 |
| 122-66-7 | MSD | Azobenzene<br>*1,2-Diphenylhydrazine* | 100 | 0.00 | U | 72.1 | 72 | 36-115 | 28 | 0-30 |
| 101-55-3 | MSD | 4-Bromophenylphenylether | 100 | 0.00 | U | 70.8 | 71 | 39-112 | 27 | 0-30 |
| 118-74-1 | MSD | Hexachlorobenzene | 100 | 0.00 | U | 66.4 | 66 | 39-114 | 25 | 0-30 |
| 87-86-5 | MSD | Pentachlorophenol | 100 | 0.00 | U | 0.00 | 0 * | 24-122 | 0 | 0-30 |
| 85-01-8 | MSD | Phenanthrene | 100 | 0.00 | U | 63.8 | 64 | 37-112 | 23 | 0-30 |
| 120-12-7 | MSD | Anthracene | 100 | 0.00 | U | 64.1 | 64 | 36-114 | 21 | 0-30 |
| 84-74-2 | MSD | Di-n-butylphthalate | 100 | 0.00 | U | 64.9 | 65 | 40-122 | 22 | 0-30 |
| 206-44-0 | MSD | Fluoranthene | 100 | 0.00 | U | 43.9 | 44 | 35-118 | 16 | 0-30 |
| 129-00-0 | MSD | Pyrene | 100 | 0.00 | U | 107 | 107 | 32-121 | 18 | 0-30 |
| 85-68-7 | MSD | Butylbenzylphthalate | 100 | 0.00 | U | 83.7 | 84 | 36-124 | 22 | 0-30 |
| 56-55-3 | MSD | Benzo(a)anthracene | 100 | 0.00 | U | 61.7 | 62 | 38-113 | 23 | 0-30 |
| 218-01-9 | MSD | Chrysene | 100 | 0.00 | U | 61.5 | 62 | 37-114 | 20 | 0-30 |
| 117-84-0 | MSD | Di-n-octylphthalate | 100 | 0.00 | U | 49.5 | 50 | 32-124 | 27 | 0-30 |
| 205-99-2 | MSD | Benzo(b)fluoranthene | 100 | 0.00 | U | 66.4 | 66 | 38-116 | 26 | 0-30 |
| 207-08-9 | MSD | Benzo(k)fluoranthene | 100 | 0.00 | U | 68.7 | 69 | 39-117 | 22 | 0-30 |
| 50-32-8 | MSD | Benzo(a)pyrene | 100 | 0.00 | U | 63.3 | 63 | 37-112 | 24 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MSD**
**Lab Sample ID** **1203201875**
**Instrument:** **MSD3.I**
**Analyst:** **JLD1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/04/2014 16:25**
**Prep Batch ID:** **1433096**
**Batch ID:** **1433097**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 193-39-5 | MSD | Indeno(1,2,3-cd)pyrene | 100 | 0.00 | U | 67.9 | 68 | 25-122 | 32 * | 0-30 |
| 53-70-3 | MSD | Dibenzo(a,h)anthracene | 100 | 0.00 | U | 79.2 | 79 | 27-125 | 33 * | 0-30 |
| 191-24-2 | MSD | Benzo(ghi)perylene | 100 | 0.00 | U | 69.8 | 70 | 24-121 | 33 * | 0-30 |
| 930-55-2 | MSD | N-Nitrosopyrrolidine | 100 | 0.00 | U | 62.1 | 62 | 43-117 | 13 | 0-30 |
| 95-94-3 | MSD | 1,2,4,5-Tetrachlorobenzene | 100 | 0.00 | U | 65.5 | 65 | 28-96 | 27 | 0-30 |
| 1912-24-9 | MSD | Atrazine | 100 | 0.00 | U | 95.2 | 95 | 18-119 | 27 | 0-30 |
| 92-87-5 | MSD | Benzidine | 200 | 0.00 | U | 0.00 | 0 * | 10-127 | 0 | 0-30 |
| 91-94-1 | MSD | 3,3'-Dichlorobenzidine | 100 | 0.00 | U | 9.42 | 9 * | 19-120 | 50 * | 0-30 |
| 120-82-1 | MSD | 1,2,4-Trichlorobenzene | 100 | 0.00 | U | 61.4 | 61 | 26-92 | 26 | 0-30 |
| 117-81-7 | MSD | bis(2-Ethylhexyl)phthalate | 100 | 120 | | 193 | 72 | 35-123 | 23 | 0-30 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1433096** | **Instrument ID:** | **MSD3.I** | **Data File:** | **s110414.B\s3k0404.D** |
| **Lab Sample ID:** | **1203201872** | **Prep Date:** | **11/04/2014 05:45** | **Analyzed:** | **11/04/14 13:02** |
| **Column:** | **DB-5ms** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1433096 | 1203201873 | s110414.B\s3k0405.D | 11/04/14 | 1331 |
| 02 CAWR-14-89228 | 360220002 | s110414.B\s3k0406.D | 11/04/14 | 1400 |
| 03 CAWR-14-89231 | 360220006 | s110414.B\s3k0407.D | 11/04/14 | 1429 |
| 04 WSTMO-14-86605MS | 1203201874 | s110414.B\s3k0410.D | 11/04/14 | 1556 |
| 05 WSTMO-14-86605MSD | 1203201875 | s110414.B\s3k0411.D | 11/04/14 | 1625 |

# Quality Control Data

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203201872** | | | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1433096** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 13:02** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0404.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 90-12-0 | 1-Methylnaphthalene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-57-6 | 2-Methylnaphthalene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 83-32-9 | Acenaphthene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 208-96-8 | Acenaphthylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 120-12-7 | Anthracene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 56-55-3 | Benzo(a)anthracene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 50-32-8 | Benzo(a)pyrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 205-99-2 | Benzo(b)fluoranthene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 191-24-2 | Benzo(ghi)perylene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203201872** | | | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1433096** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 13:02** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0404.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 218-01-9 | Chrysene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 206-44-0 | Fluoranthene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 86-73-7 | Fluorene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 118-74-1 | Hexachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-86-5 | Pentachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-01-8 | Phenanthrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 129-00-0 | Pyrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203201872** | | | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1433096** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 13:02** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0404.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 79.7 | 100 | ug/L | 79.7 | (33%-126%) |
| 2-Fluorobiphenyl | 45.0 | 50.0 | ug/L | 90.0 | (35%-102%) |
| 2-Fluorophenol | 47.8 | 100 | ug/L | 47.8 | (18%-84%) |
| Nitrobenzene-d5 | 42.7 | 50.0 | ug/L | 85.4 | (38%-113%) |
| Phenol-d5 | 29.6 | 100 | ug/L | 29.6 | (10%-110%) |
| p-Terphenyl-d14 | 45.6 | 50.0 | ug/L | 91.1 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| 000067-66-3 | Trichloromethane | 2.107 | 67.7 | ug/L | 95 | NJ |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203201873** | | | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1433096** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 13:31** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0405.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 37.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 29.6 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 28.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | | 46.4 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 26.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 27.8 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | | 22.1 | ug/L | 3.00 | 10.0 |
| 90-12-0 | 1-Methylnaphthalene | | 35.6 | ug/L | 0.300 | 1.00 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 29.6 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 38.4 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 38.7 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 38.1 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 34.6 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 25.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 39.2 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 41.9 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | | 39.3 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | | 33.9 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 28.4 | ug/L | 3.00 | 10.0 |
| 91-57-6 | 2-Methylnaphthalene | | 33.4 | ug/L | 0.300 | 1.00 |
| 88-75-5 | 2-Nitrophenol | | 40.2 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 38.4 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 47.3 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | | 36.1 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 40.5 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 38.9 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | | 10.5 | ug/L | 3.00 | 10.0 |
| 83-32-9 | Acenaphthene | | 39.2 | ug/L | 0.300 | 1.00 |
| 208-96-8 | Acenaphthylene | | 40.0 | ug/L | 0.300 | 1.00 |
| 62-53-3 | Aniline | | 38.3 | ug/L | 4.20 | 10.0 |
| 120-12-7 | Anthracene | | 40.8 | ug/L | 0.300 | 1.00 |
| 1912-24-9 | Atrazine | | 54.4 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | | 42.8 | ug/L | 3.90 | 10.0 |
| 56-55-3 | Benzo(a)anthracene | | 41.7 | ug/L | 0.300 | 1.00 |
| 50-32-8 | Benzo(a)pyrene | | 42.0 | ug/L | 0.300 | 1.00 |
| 205-99-2 | Benzo(b)fluoranthene | | 41.4 | ug/L | 0.300 | 1.00 |
| 191-24-2 | Benzo(ghi)perylene | | 51.1 | ug/L | 0.300 | 1.00 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203201873** | | | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1433096** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 13:31** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0405.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | | 41.5 | ug/L | 0.300 | 1.00 |
| 65-85-0 | Benzoic acid | | 23.5 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | | 33.8 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | | 45.3 | ug/L | 3.00 | 10.0 |
| 218-01-9 | Chrysene | | 42.5 | ug/L | 0.300 | 1.00 |
| 84-74-2 | Di-n-butylphthalate | | 46.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | | 43.8 | ug/L | 3.00 | 10.0 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 54.2 | ug/L | 0.300 | 1.00 |
| 132-64-9 | Dibenzofuran | | 41.6 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | | 41.7 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | | 43.3 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-39-4 | Diphenylamine | | 53.1 | ug/L | 3.00 | 10.0 |
| 206-44-0 | Fluoranthene | | 36.6 | ug/L | 0.300 | 1.00 |
| 86-73-7 | Fluorene | | 38.7 | ug/L | 0.300 | 1.00 |
| 118-74-1 | Hexachlorobenzene | | 45.5 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | | 24.4 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 24.7 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | | 21.8 | ug/L | 3.00 | 10.0 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 42.5 | ug/L | 0.300 | 1.00 |
| 78-59-1 | Isophorone | | 38.4 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 25.3 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 36.9 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 35.5 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | | 32.1 | ug/L | 0.300 | 1.00 |
| 98-95-3 | Nitrobenzene | | 36.4 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-86-5 | Pentachlorophenol | | 23.3 | ug/L | 3.00 | 10.0 |
| 85-01-8 | Phenanthrene | | 40.8 | ug/L | 0.300 | 1.00 |
| 108-95-2 | Phenol | | 14.0 | ug/L | 3.00 | 10.0 |
| 129-00-0 | Pyrene | | 42.1 | ug/L | 0.300 | 1.00 |
| 110-86-1 | Pyridine | | 27.2 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 38.7 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 37.4 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 35.1 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 44.4 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203201873** | | | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1433096** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 13:31** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0405.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | | 30.6 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 39.3 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | | 29.9 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 41.8 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 41.9 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 65.0 | 100 | ug/L | 65.0 | (33%-126%) |
| 2-Fluorobiphenyl | 39.2 | 50.0 | ug/L | 78.4 | (35%-102%) |
| 2-Fluorophenol | 39.9 | 100 | ug/L | 39.9 | (18%-84%) |
| Nitrobenzene-d5 | 34.5 | 50.0 | ug/L | 69.1 | (38%-113%) |
| Phenol-d5 | 24.3 | 100 | ug/L | 24.3 | (10%-110%) |
| p-Terphenyl-d14 | 38.4 | 50.0 | ug/L | 76.8 | (38%-123%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 09:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203201874** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WSTMO-14-86605MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 15:56** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **500 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0410.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 50.1 | ug/L | 6.00 | 20.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 47.3 | ug/L | 6.00 | 20.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 45.2 | ug/L | 6.00 | 20.0 |
| 122-66-7 | Azobenzene | | 54.4 | ug/L | 6.00 | 20.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 42.2 | ug/L | 6.00 | 20.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 44.6 | ug/L | 6.00 | 20.0 |
| 123-91-1 | 1,4-Dioxane | | 37.8 | ug/L | 6.00 | 20.0 |
| 90-12-0 | 1-Methylnaphthalene | | 51.8 | ug/L | 0.600 | 2.00 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 20.0 | ug/L | 6.00 | 20.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 20.2 | ug/L | 6.00 | 20.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | J | 17.2 | ug/L | 6.00 | 20.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 29.5 | ug/L | 6.00 | 20.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 45.1 | ug/L | 6.00 | 20.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 40.0 | ug/L | 10.0 | 40.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 20.8 | ug/L | 6.00 | 20.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 25.6 | ug/L | 6.00 | 20.0 |
| 91-58-7 | 2-Chloronaphthalene | | 53.7 | ug/L | 0.820 | 2.00 |
| 95-57-8 | 2-Chlorophenol | | 27.4 | ug/L | 6.00 | 20.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 20.0 | ug/L | 6.00 | 20.0 |
| 91-57-6 | 2-Methylnaphthalene | | 48.3 | ug/L | 0.600 | 2.00 |
| 88-75-5 | 2-Nitrophenol | J | 6.24 | ug/L | 6.00 | 20.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | J | 15.7 | ug/L | 6.00 | 20.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 53.8 | ug/L | 6.00 | 20.0 |
| 59-50-7 | Parachlorometa cresol | | 33.6 | ug/L | 6.00 | 20.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 46.1 | ug/L | 6.60 | 20.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 50.3 | ug/L | 6.00 | 20.0 |
| 100-02-7 | 4-Nitrophenol | U | 20.0 | ug/L | 6.00 | 20.0 |
| 83-32-9 | Acenaphthene | | 50.1 | ug/L | 0.600 | 2.00 |
| 208-96-8 | Acenaphthylene | | 54.0 | ug/L | 0.600 | 2.00 |
| 62-53-3 | Aniline | | 49.6 | ug/L | 8.40 | 20.0 |
| 120-12-7 | Anthracene | | 51.8 | ug/L | 0.600 | 2.00 |
| 1912-24-9 | Atrazine | | 72.3 | ug/L | 6.00 | 20.0 |
| 92-87-5 | Benzidine | U | 20.0 | ug/L | 7.80 | 20.0 |
| 56-55-3 | Benzo(a)anthracene | | 48.9 | ug/L | 0.600 | 2.00 |
| 50-32-8 | Benzo(a)pyrene | | 49.8 | ug/L | 0.600 | 2.00 |
| 205-99-2 | Benzo(b)fluoranthene | | 51.3 | ug/L | 0.600 | 2.00 |
| 191-24-2 | Benzo(ghi)perylene | | 50.2 | ug/L | 0.600 | 2.00 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 09:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203201874** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WSTMO-14-86605MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 15:56** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **500 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0410.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | | 54.9 | ug/L | 0.600 | 2.00 |
| 65-85-0 | Benzoic acid | J | 29.6 | ug/L | 12.0 | 40.0 |
| 100-51-6 | Benzyl alcohol | | 52.9 | ug/L | 6.00 | 20.0 |
| 85-68-7 | Butylbenzylphthalate | | 67.0 | ug/L | 6.00 | 20.0 |
| 218-01-9 | Chrysene | | 50.6 | ug/L | 0.600 | 2.00 |
| 84-74-2 | Di-n-butylphthalate | | 51.9 | ug/L | 6.00 | 20.0 |
| 117-84-0 | Di-n-octylphthalate | | 37.9 | ug/L | 6.00 | 20.0 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 57.0 | ug/L | 0.600 | 2.00 |
| 132-64-9 | Dibenzofuran | | 56.5 | ug/L | 6.00 | 20.0 |
| 84-66-2 | Diethylphthalate | | 57.5 | ug/L | 6.00 | 20.0 |
| 131-11-3 | Dimethylphthalate | | 61.0 | ug/L | 6.00 | 20.0 |
| 88-85-7 | Dinoseb | U | 20.0 | ug/L | 6.00 | 20.0 |
| 122-39-4 | Diphenylamine | | 64.1 | ug/L | 6.00 | 20.0 |
| 206-44-0 | Fluoranthene | | 37.3 | ug/L | 0.600 | 2.00 |
| 86-73-7 | Fluorene | | 52.4 | ug/L | 0.600 | 2.00 |
| 118-74-1 | Hexachlorobenzene | | 51.5 | ug/L | 6.00 | 20.0 |
| 87-68-3 | Hexachlorobutadiene | | 41.7 | ug/L | 6.00 | 20.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 20.0 | ug/L | 6.00 | 20.0 |
| 67-72-1 | Hexachloroethane | | 25.9 | ug/L | 6.00 | 20.0 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 49.2 | ug/L | 0.600 | 2.00 |
| 78-59-1 | Isophorone | | 53.5 | ug/L | 7.00 | 20.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 35.7 | ug/L | 6.00 | 20.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 20.0 | ug/L | 6.00 | 20.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 20.0 | ug/L | 6.00 | 20.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 54.6 | ug/L | 6.00 | 20.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 54.3 | ug/L | 6.00 | 20.0 |
| 91-20-3 | Naphthalene | | 48.6 | ug/L | 0.600 | 2.00 |
| 98-95-3 | Nitrobenzene | | 49.5 | ug/L | 6.00 | 20.0 |
| 608-93-5 | Pentachlorobenzene | U | 20.0 | ug/L | 6.00 | 20.0 |
| 87-86-5 | Pentachlorophenol | U | 20.0 | ug/L | 6.00 | 20.0 |
| 85-01-8 | Phenanthrene | | 50.7 | ug/L | 0.600 | 2.00 |
| 108-95-2 | Phenol | J | 11.9 | ug/L | 6.00 | 20.0 |
| 129-00-0 | Pyrene | | 89.0 | ug/L | 0.600 | 2.00 |
| 110-86-1 | Pyridine | | 46.8 | ug/L | 6.00 | 20.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 55.1 | ug/L | 6.00 | 20.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 53.4 | ug/L | 6.00 | 20.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 50.8 | ug/L | 6.00 | 20.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 154 | ug/L | 6.00 | 20.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 09:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203201874** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WSTMO-14-86605MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 15:56** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **500 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0410.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | | 31.2 | ug/L | 7.40 | 20.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 41.8 | ug/L | 6.00 | 20.0 |
| 95-48-7 | o-Cresol | | 31.2 | ug/L | 6.00 | 20.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 51.0 | ug/L | 6.00 | 20.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 54.8 | ug/L | 6.00 | 20.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | | Acceptable Limits |
|---|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 20.0 | 200 | ug/L | 7.15 | * | (33%-126%) |
| 2-Fluorobiphenyl | 50.1 | 100 | ug/L | 50.1 | | (35%-102%) |
| 2-Fluorophenol | 30.8 | 200 | ug/L | 15.4 | * | (18%-84%) |
| Nitrobenzene-d5 | 47.0 | 100 | ug/L | 47.0 | | (38%-113%) |
| Phenol-d5 | 20.6 | 200 | ug/L | 10.3 | | (10%-110%) |
| p-Terphenyl-d14 | 76.6 | 100 | ug/L | 76.6 | | (38%-123%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 09:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203201875** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WSTMO-14-86605MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 16:25** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **500 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0411.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 65.5 | ug/L | 6.00 | 20.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 61.4 | ug/L | 6.00 | 20.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 58.2 | ug/L | 6.00 | 20.0 |
| 122-66-7 | Azobenzene | | 72.1 | ug/L | 6.00 | 20.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 55.7 | ug/L | 6.00 | 20.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 58.6 | ug/L | 6.00 | 20.0 |
| 123-91-1 | 1,4-Dioxane | | 46.5 | ug/L | 6.00 | 20.0 |
| 90-12-0 | 1-Methylnaphthalene | | 64.3 | ug/L | 0.600 | 2.00 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 20.0 | ug/L | 6.00 | 20.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 43.1 | ug/L | 6.00 | 20.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 42.4 | ug/L | 6.00 | 20.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 48.3 | ug/L | 6.00 | 20.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 60.9 | ug/L | 6.00 | 20.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 40.0 | ug/L | 10.0 | 40.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 27.1 | ug/L | 6.00 | 20.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 32.1 | ug/L | 6.00 | 20.0 |
| 91-58-7 | 2-Chloronaphthalene | | 69.3 | ug/L | 0.820 | 2.00 |
| 95-57-8 | 2-Chlorophenol | | 41.9 | ug/L | 6.00 | 20.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 20.0 | ug/L | 6.00 | 20.0 |
| 91-57-6 | 2-Methylnaphthalene | | 61.3 | ug/L | 0.600 | 2.00 |
| 88-75-5 | 2-Nitrophenol | J | 14.2 | ug/L | 6.00 | 20.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | J | 9.42 | ug/L | 6.00 | 20.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 70.8 | ug/L | 6.00 | 20.0 |
| 59-50-7 | Parachlorometa cresol | | 52.6 | ug/L | 6.00 | 20.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 31.5 | ug/L | 6.60 | 20.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 62.5 | ug/L | 6.00 | 20.0 |
| 100-02-7 | 4-Nitrophenol | J | 12.1 | ug/L | 6.00 | 20.0 |
| 83-32-9 | Acenaphthene | | 62.8 | ug/L | 0.600 | 2.00 |
| 208-96-8 | Acenaphthylene | | 68.3 | ug/L | 0.600 | 2.00 |
| 62-53-3 | Aniline | | 32.7 | ug/L | 8.40 | 20.0 |
| 120-12-7 | Anthracene | | 64.1 | ug/L | 0.600 | 2.00 |
| 1912-24-9 | Atrazine | | 95.2 | ug/L | 6.00 | 20.0 |
| 92-87-5 | Benzidine | U | 20.0 | ug/L | 7.80 | 20.0 |
| 56-55-3 | Benzo(a)anthracene | | 61.7 | ug/L | 0.600 | 2.00 |
| 50-32-8 | Benzo(a)pyrene | | 63.3 | ug/L | 0.600 | 2.00 |
| 205-99-2 | Benzo(b)fluoranthene | | 66.4 | ug/L | 0.600 | 2.00 |
| 191-24-2 | Benzo(ghi)perylene | | 69.8 | ug/L | 0.600 | 2.00 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 09:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203201875** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WSTMO-14-86605MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 16:25** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **500 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0411.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 207-08-9 | Benzo(k)fluoranthene | | 68.7 | ug/L | 0.600 | 2.00 |
| 65-85-0 | Benzoic acid | J | 33.7 | ug/L | 12.0 | 40.0 |
| 100-51-6 | Benzyl alcohol | | 61.2 | ug/L | 6.00 | 20.0 |
| 85-68-7 | Butylbenzylphthalate | | 83.7 | ug/L | 6.00 | 20.0 |
| 218-01-9 | Chrysene | | 61.5 | ug/L | 0.600 | 2.00 |
| 84-74-2 | Di-n-butylphthalate | | 64.9 | ug/L | 6.00 | 20.0 |
| 117-84-0 | Di-n-octylphthalate | | 49.5 | ug/L | 6.00 | 20.0 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 79.2 | ug/L | 0.600 | 2.00 |
| 132-64-9 | Dibenzofuran | | 71.3 | ug/L | 6.00 | 20.0 |
| 84-66-2 | Diethylphthalate | | 73.7 | ug/L | 6.00 | 20.0 |
| 131-11-3 | Dimethylphthalate | | 79.0 | ug/L | 6.00 | 20.0 |
| 88-85-7 | Dinoseb | U | 20.0 | ug/L | 6.00 | 20.0 |
| 122-39-4 | Diphenylamine | | 77.0 | ug/L | 6.00 | 20.0 |
| 206-44-0 | Fluoranthene | | 43.9 | ug/L | 0.600 | 2.00 |
| 86-73-7 | Fluorene | | 64.5 | ug/L | 0.600 | 2.00 |
| 118-74-1 | Hexachlorobenzene | | 66.4 | ug/L | 6.00 | 20.0 |
| 87-68-3 | Hexachlorobutadiene | | 55.3 | ug/L | 6.00 | 20.0 |
| 77-47-4 | Hexachlorocyclopentadiene | J | 11.8 | ug/L | 6.00 | 20.0 |
| 67-72-1 | Hexachloroethane | | 32.7 | ug/L | 6.00 | 20.0 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 67.9 | ug/L | 0.600 | 2.00 |
| 78-59-1 | Isophorone | | 68.2 | ug/L | 7.00 | 20.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 41.9 | ug/L | 6.00 | 20.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 20.0 | ug/L | 6.00 | 20.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 20.0 | ug/L | 6.00 | 20.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 66.2 | ug/L | 6.00 | 20.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 62.1 | ug/L | 6.00 | 20.0 |
| 91-20-3 | Naphthalene | | 62.0 | ug/L | 0.600 | 2.00 |
| 98-95-3 | Nitrobenzene | | 63.8 | ug/L | 6.00 | 20.0 |
| 608-93-5 | Pentachlorobenzene | U | 20.0 | ug/L | 6.00 | 20.0 |
| 87-86-5 | Pentachlorophenol | U | 20.0 | ug/L | 6.00 | 20.0 |
| 85-01-8 | Phenanthrene | | 63.8 | ug/L | 0.600 | 2.00 |
| 108-95-2 | Phenol | J | 16.5 | ug/L | 6.00 | 20.0 |
| 129-00-0 | Pyrene | | 107 | ug/L | 0.600 | 2.00 |
| 110-86-1 | Pyridine | | 53.4 | ug/L | 6.00 | 20.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 68.5 | ug/L | 6.00 | 20.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 68.4 | ug/L | 6.00 | 20.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 64.2 | ug/L | 6.00 | 20.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 193 | ug/L | 6.00 | 20.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 09:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203201875** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1433096** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WSTMO-14-86605MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433097** | **Inst:** | **MSD3.I** | **Dilution:** | **1** |
| **Run Date:** | **11/04/2014 16:25** | **Analyst:** | **JLD1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/04/2014 05:45** | **Aliquot:** | **500 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110414.B\s3k0411.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 65794-96-9 | m,p-Cresols | | 45.3 | ug/L | 7.40 | 20.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 36.9 | ug/L | 6.00 | 20.0 |
| 95-48-7 | o-Cresol | | 46.1 | ug/L | 6.00 | 20.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 64.1 | ug/L | 6.00 | 20.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 47.9 | ug/L | 6.00 | 20.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | | Acceptable Limits |
|---|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 56.9 | 200 | ug/L | 28.4 | * | (33%-126%) |
| 2-Fluorobiphenyl | 65.1 | 100 | ug/L | 65.1 | | (35%-102%) |
| 2-Fluorophenol | 44.0 | 200 | ug/L | 22.0 | | (18%-84%) |
| Nitrobenzene-d5 | 62.2 | 100 | ug/L | 62.2 | | (38%-113%) |
| Phenol-d5 | 29.1 | 200 | ug/L | 14.6 | | (10%-110%) |
| p-Terphenyl-d14 | 94.9 | 100 | ug/L | 94.9 | | (38%-123%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 06-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| SEMIVOA GC/MS | SW846 3510C/8270D | Liquid | ARSL (ESHL) |
| **Batch ID:** | **Sample Numbers:** | | |
| 1433097 | See Below | | |

**Potentially affected work order(s)(SDG): 360220(2015-187),360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Failed Yield for Surrogates

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Samples 360294006, 360294008, 360298006, MS(1203201874), MSD(1203201875) and 360288006 displayed surrogate recovery failures. Please see the QC Summary/Surrogate Recovery Report for specific failures. | 1. Since the parent sample 360288006 and the associated MS/MSD pair displayed similar surrogate recoveries, the failures were attributed to matrix interference and the data results are reported.<br>Samples 360294006, 360294008 and 360298006 were diluted 1:2 prior to extraction and recovered surrogates outside of the acceptance limits. The samples were re-analyzed at a 1:5 dilution and again displayed failing surrogate recoveries. The data are reported from the 1:5 dilution per client request. |
| 2. The MS(1203201874) and MSD(1203201875) recovered spiked analytes outside of their established acceptance limits. Please see the QC Summary/Spike Recovery Report for the specific failures.<br><br>3. The relative percent differences (RPD) for the MS(1203201874) and MSD(1203201875) were not within the acceptance limits. Please see the QC Summary/Spike Recovery Report for the specific failures. | 2. & 3. As similar recoveries were displayed in the MS and MSD, the failures were attributed to sample matrix interference and the data are reported. |

**Originator's Name:**

Jennifer Dunagan Jones 06-NOV-14

**Data Validator/Group Leader:**

Herbert Maier 07-NOV-14

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International, LLC (ARSL)**
**SDG 2015-187**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1432727 |
| Prep Batch Number: | 1432726 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203200970 | Interference Check Sample (ICS) |
| 1203200966 | Method Blank (MB) |
| 1203200967 | Laboratory Control Sample (LCS) |
| 1203200968 | 360220007(CAWR-14-89235) Matrix Spike (MS) |
| 1203200969 | 360220007(CAWR-14-89235) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
The initial calibration verification standard (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 360220007 (CAWR-14-89235) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Manual integrations were not required for any data file associated with this SDG.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-187  GEL Work Order: 360220

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 14 NOV 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1432726

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-89235

**Date Received:** 31-OCT-14

**GEL Job No (SDG):** 2015-187

**GEL Sample ID:** 360220007

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.169 | ug/L | J | 1 | 08-NOV-14 01:05 | per1107050a |
| | Perchlorate Isotope Ratio | | | 3.16 | | | 1 | 08-NOV-14 01:05 | per1107050a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.167 | ug/L | J | 1 | 08-NOV-14 01:05 | per1107050a |
| | Perchlorate-O(18) | | | 0.524 | ug/L | | 1 | 08-NOV-14 01:05 | per1107050a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2015-187

**Extract Batch Code:** 1432726

**Date Filtered:** 06-NOV-14

**Matrix:** WATER

**Sample ID:** 1203200967

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .196 | ug/L | 98.2 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.17 | | | | - |
| Perchlorate-101 | 0.200 | .193 | ug/L | 96.3 | | 85 - 115 |
| Perchlorate-O(18) | | .486 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2015-187

**Extract Batch Code:** 1432726

**Date Extracted:** 06-NOV-14

**GEL MS/PS ID:** 1203200968

**Client ID:** CAWR-14-89235

**GEL MSD/PSD ID:** 1203200969

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.169 | ug/L | 0.372 | 102 | .374 | 103 | .542 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.16 | | 3.2 | | 3.14 | | 1.87 | | - |
| Perchlorate-101 | 0.200 | 0.167 | ug/L | 0.363 | 98 | .372 | 102 | 2.42 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.524 | ug/L | 0.516 | | .513 | | .565 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1432726

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 06-NOV-14

**GEL Job No (SDG):** 2015-187

**GEL Sample ID:** 1203200966

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 08-NOV-14 00:38 | per1107047a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 08-NOV-14 00:38 | per1107047a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 08-NOV-14 00:38 | per1107047a |
| | Perchlorate-O(18) | | | 0.495 | ug/L | | 1 | 08-NOV-14 00:38 | per1107047a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1432726

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 06-NOV-14

**GEL Job No (SDG):** 2015-187

**GEL Sample ID:** 1203200967

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.196 | ug/L | J | 1 | 08-NOV-14 00:47 | per1107048a |
| | Perchlorate Isotope Ratio | | | 3.17 | | | 1 | 08-NOV-14 00:47 | per1107048a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.193 | ug/L | J | 1 | 08-NOV-14 00:47 | per1107048a |
| | Perchlorate-O(18) | | | 0.486 | ug/L | | 1 | 08-NOV-14 00:47 | per1107048a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1432726

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2015-187

**GEL Sample ID:** 1203200970

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.210 | ug/L | | 1 | 08-NOV-14 00:56 | per1107049a |
| | Perchlorate Isotope Ratio | | | 3.16 | | | 1 | 08-NOV-14 00:56 | per1107049a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.207 | ug/L | | 1 | 08-NOV-14 00:56 | per1107049a |
| | Perchlorate-O(18) | | | 0.505 | ug/L | | 1 | 08-NOV-14 00:56 | per1107049a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1432726

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-89235MS

**Date Received:** 31-OCT-14

**GEL Job No (SDG):** 2015-187

**GEL Sample ID:** 1203200968

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.372 | ug/L | | 1 | 08-NOV-14 01:14 | per1107051a |
| | Perchlorate Isotope Ratio | | | 3.2 | | | 1 | 08-NOV-14 01:14 | per1107051a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.363 | ug/L | | 1 | 08-NOV-14 01:14 | per1107051a |
| | Perchlorate-O(18) | | | 0.516 | ug/L | | 1 | 08-NOV-14 01:14 | per1107051a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1432726

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-89235MSD

**Date Received:** 31-OCT-14

**GEL Job No (SDG):** 2015-187

**GEL Sample ID:** 1203200969

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.374 | ug/L | | 1 | 08-NOV-14 01:22 | per1107052a |
| | Perchlorate Isotope Ratio | | | 3.14 | | | 1 | 08-NOV-14 01:22 | per1107052a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.372 | ug/L | | 1 | 08-NOV-14 01:22 | per1107052a |
| | Perchlorate-O(18) | | | 0.513 | ug/L | | 1 | 08-NOV-14 01:22 | per1107052a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Explosives by LCMSMS Analysis

# Case Narrative

**LC-MS/MS Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-187**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Analysis of Nitroaromatic Explosives Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by SW-846 Method 8321 Modified (8321M)** |
| Analytical Method: | SW846 3535/8321A Modified |
| Prep Method: | SW846 Method 3535 |
| Analytical Batch Number: | 1433023 |
| Prep Batch Number: | 1433022 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535/8321A Modified:

| Sample ID | Client ID |
|---|---|
| 360220003 | CAWR-14-89228 |
| 360220005 | CAWR-14-89231 |
| 1203201687 | MB for batch 1433022 |
| 1203201688 | Laboratory Control Sample (LCS) |
| 1203201689 | 360288007(WSTMO-14-86605) Matrix Spike (MS) |
| 1203201690 | 360288007(WSTMO-14-86605) Matrix Spike Duplicate (MSD) |

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-056 REV# 17.

**Primary Analyte Analysis**

## Calibration Information

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
The following calibration verification standards have not met requirements of 80-120% for this SDG: EXP1128059, EXP1128072, and EXP1128085. The data are Q qualified and are reported as stated in the SOP. The analytes were not detected in the associated samples. The data are Q qualified and are reported as stated in the SOP. See the Form 7A of the data package for the exact recoveries.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
Low Level Calibration Verification Standard EXP1128087 did not meet acceptance criteria of 70-130% for the recovery of HMX at 130.3% and PETN at 138%. The biased high recoveries are an indication that the instrument had more than the required sensitivity to detect the target analytes. Since target analytes were not detected in the associated samples, the data are considered unaffected. The data are Q qualified and are reported with the appropriate DER. See the Form 7B of the data package for the exact recoveries.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS (1203201688) did not meet acceptance criteria for the recovery of HMX at 121%. The limits are 61-118%. Since the HMX recovery was biased high and HMX was not detected in the associated samples, the data are considered unaffected and are reported with the appropriate DER.

**QC Sample Designation**
Client sample 360288007 (WSTMO-14-86605) from SDG 2015-191 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS (1203201689) did not meet acceptance criteria for the recovery of multiple target analytes. Please refer to Form 3 of the data package for a complete list of recoveries. The MSD (1203201690) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD (1203201690) did not meet acceptance criteria for the recovery of multiple target analytes. Please refer to Form 3 of the data package for a complete list of recoveries. The MS (1203201689) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.

**MS/MSD Relative Percent Difference (RPD) Statement**
The MS/MSD pair (1203201689/1203201690) did not meet RPD acceptance criteria for PETN at 21.6%. The limits are 0-20%. Both the MS (1203201689) and MSD (1203201690) recoveries for PETN met acceptance criteria. Since PETN was not detected in the parent sample, 360288007 (WSTMO-14-8660), the data are considered unaffected and are reported with the appropriate DER.

**Internal Standard (ISTD) Acceptance**
A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000.

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
At the request of the client, a 2x dilution was performed on QC samples 1203201689 (WSTMO-14-86605MS) and 1203201690 (WSTMO-14-86605MSD) prior to the extraction process.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

**Secondary Analyte Analysis**

**Calibration Information**

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
The following calibration verification standards have not met requirements of 80-120% for this SDG: EXS11200024. The data are Q qualified and are reported as stated in the SOP. See the Form 7A of the data package for the exact recoveries.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
Low Level Calibration Verification Standard EXS1128026 did not meet acceptance criteria of 70-130% for the recovery of 2,6-Diamino-4-nitrotoluene at 65.5% and 2,4-Diamino-6-nitrotoluene at 52.4%. The biased low CRI recoveries were confirmed by re-analysis. The data from the first analysis are Q qualified and reported with the appropriate DER. The confirmation raw data are located in the Miscellaneous section of the data package.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries were within the established acceptance limits.

**QC Sample Designation**
Client sample 360288007 (WSTMO-14-86605) from SDG 2015-191 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS (1203201689) did not meet acceptance criteria for the recovery of tris(o-cresyl) phosphate at 41.0%. The recovery limits are 44-92%. The MSD (1203201690) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD (1203201690) did not meet acceptance criteria for the recovery of tris(o-cresyl) phosphate at 42.0%. The recovery limits are 44-92%. The MS (1203201689) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits for this analysis.

**Internal Standard (ISTD) Acceptance**
The internal standard was not added to the Secondary analyte extracts.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
At the request of the client, a 2x dilution was performed on QC samples 1203201689 (WSTMO-14-86605MS) and 1203201690 (WSTMO-14-86605MSD) prior to the extraction process.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
The analytical batch was re-analyzed for the Secondary analytes due to biased low CRI recoveries in the initial analysis. The biased low recoveries were confirmed by the re-analysis. The data from the first analysis are Q qualified and reported with the appropriate DER. The confirmation raw data are located in the Miscellaneous section of the data package.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data Exception Report 1363622 was generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples required manual integrations due to software limitations.

**Additional Comments**
Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct.

Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LC-MS/MS #1, and LC-MS/MS #2, respectively. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis.

The laboratory also utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC-MS/MS #3 or LC-MS/MS #4. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

The detection of the Primary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

The detection of the Secondary analytes is accomplished through analysis on the following reversed phase column:

YMC: J'sphere ODS-H80, 150 x 4.6mm I.D.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-187  GEL Work Order: 360220

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

Q  One or more quality control criteria have not been met. Refer to the applicable narrative or DER.

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 15 DEC 2014**  **Title: Group Leader**

# Sample Data Summary

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89228

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 360220003

**Sample Amount** 820 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128068.wiff

**Date Analyzed:** 30-NOV-14 03:59

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.305 | U | 0.0976 | 0.305 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.305 | U | 0.0976 | 0.305 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.305 | U | 0.0976 | 0.305 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.305 | QU | 0.0976 | 0.305 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.305 | QU | 0.0976 | 0.305 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.305 | U | 0.0976 | 0.305 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.305 | U | 0.0976 | 0.305 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.305 | U | 0.100 | 0.305 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.305 | QU | 0.0976 | 0.305 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.305 | U | 0.0976 | 0.305 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.305 | U | 0.0976 | 0.305 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.305 | U | 0.0976 | 0.305 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.610 | U | 0.0976 | 0.610 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89228

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 360220003

**Sample Amount** 820 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.610 | U | 0.122 | 0.610 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.610 | U | 0.183 | 0.610 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89228

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 360220003

**Sample Amount** 820 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS11200016.wiff

**Date Analyzed:** 20-NOV-14 14:51

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.22 | U | 0.366 | 1.22 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.22 | U | 0.366 | 1.22 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.22 | U | 0.366 | 1.22 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 3.05 | QU | 0.610 | 3.05 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 3.05 | QU | 0.610 | 3.05 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89231

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 360220005

**Sample Amount** 950 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128069.wiff

**Date Analyzed:** 30-NOV-14 04:34

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.263 | U | 0.0842 | 0.263 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.263 | QU | 0.0842 | 0.263 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.263 | QU | 0.0842 | 0.263 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.263 | U | 0.0863 | 0.263 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.263 | QU | 0.0842 | 0.263 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.263 | U | 0.0842 | 0.263 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.263 | U | 0.0842 | 0.263 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.526 | U | 0.0842 | 0.526 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89231

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 360220005

**Sample Amount** 950 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.526 | U | 0.105 | 0.526 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.526 | U | 0.158 | 0.526 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89231

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 360220005

**Sample Amount** 950 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS11200017.wiff

**Date Analyzed:** 20-NOV-14 15:07

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.05 | U | 0.316 | 1.05 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.05 | U | 0.316 | 1.05 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.05 | U | 0.316 | 1.05 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.63 | QU | 0.526 | 2.63 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.63 | QU | 0.526 | 2.63 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# Quality Control Summary

# High Explosives Surrogate Recovery Summary

**Lab Name:** GEL Laboratories LLC **GEL Job No (SDG):** 2015-187

**Lab Code:** GEL **HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 360220003 | CAWR-14-89228 | 80.4 | 65 - 114 | |
| 360220005 | CAWR-14-89231 | 89.6 | 65 - 114 | |
| 1203201687 | MB for batch 1433022 | 82 | 65 - 114 | |
| 1203201688 | LCS for batch 1433022 | 82.4 | 65 - 114 | |
| 1203201689 | WSTMO-14-86605MS | 84.8 | 65 - 114 | |
| 1203201690 | WSTMO-14-86605MSD | 89.6 | 65 - 114 | |

DNT = 3,4-Dinitrotoluene

**Lab Code:** GEL **HPLC Column:** YMC J'sphere ODS-H80

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 360220003 | CAWR-14-89228 | 88 | 65 - 114 | |
| 360220005 | CAWR-14-89231 | 91.2 | 65 - 114 | |
| 1203201687 | MB for batch 1433022 | 87.6 | 65 - 114 | |
| 1203201688 | LCS for batch 1433022 | 89.6 | 65 - 114 | |
| 1203201689 | WSTMO-14-86605MS | 90.4 | 65 - 114 | |
| 1203201690 | WSTMO-14-86605MSD | 96 | 65 - 114 | |

DNT = 3,4-Dinitrotoluene

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Extract Batch Code:** 1433022

**Date Extracted:** 05-NOV-14

**GEL LCS ID:** 1203201688

**GEL LCSDUP ID:**

**Analysis Date/Time:** 30-NOV-14 03:24

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec | # | LCSD Conc | LCSD Rec | # | RPD | # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | 5 | 4.34 | 86.8 | | | | | | | | 70 - 116 |
| 2,4,6-Trinitrotoluene | 5 | 4.25 | 85 | | | | | | | | 71 - 119 |
| 2,4-Dinitrotoluene | 5 | 4.4 | 88 | | | | | | | | 74 - 114 |
| 2,6-Dinitrotoluene | 5 | 4.53 | 90.6 | | | | | | | | 73 - 108 |
| 2-Amino-4,6-dinitrotoluene | 5 | 4.08 | 81.6 | | | | | | | | 71 - 119 |
| 4-Amino-2,6-dinitrotoluene | 5 | 4.85 | 97 | | | | | | | | 75 - 120 |
| HMX | 5 | 6.03 | 121 | * | | | | | | | 61 - 118 |
| Nitrobenzene | 5 | 3.67 | 73.4 | | | | | | | | 65 - 112 |
| PETN | 5 | 4.46 | 89.2 | | | | | | | | 64 - 119 |
| RDX | 5 | 4.58 | 91.6 | | | | | | | | 71 - 125 |
| Tetryl | 5 | 3.75 | 75 | | | | | | | | 62 - 117 |
| m-Dinitrobenzene | 5 | 5.17 | 103 | | | | | | | | 73 - 119 |
| m-Nitrotoluene | 5 | 3.89 | 77.8 | | | | | | | | 67 - 112 |
| o-Nitrotoluene | 5 | 3.84 | 76.8 | | | | | | | | 65 - 111 |
| p-Nitrotoluene | 5 | 3.91 | 78.2 | | | | | | | | 65 - 113 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Extract Batch Code:** 1433022

**Date Extracted:** 05-NOV-14

**GEL LCS ID:** 1203201688

**GEL LCSDUP ID:**

**Analysis Date/Time:** 20-NOV-14 14:34

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec # | LCSD Conc | LCSD Rec # | RPD # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 5 | 3.86 | 77.2 | | | | | 58 - 108 |
| 2,6-Diamino-4-nitrotoluene | 5 | 4.44 | 88.8 | | | | | 65 - 110 |
| 3,5-Dinitroaniline | 5 | 3.97 | 79.4 | | | | | 69 - 118 |
| TATB | 5 | 5.85 | 117 | | | | | 23 - 142 |
| tris(o-cresyl) phosphate | 5 | 3.49 | 69.8 | | | | | 42 - 89 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

# High Explosives MS/MSD Summary

**Lab Name:** GEL Laboratories LLC

**Client ID:** WSTMO-14-86605

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Extract Batch Code:** 1433022

**Date Extracted:** 05-NOV-14

**GEL Spike ID:** 1203201689

**GEL SpikeDup ID:** 1203201690

**Analysis Date/Time:** 30-NOV-14 08:04

**MSD Analysis Date/Time:** 30-NOV-14 08:39

**Reporting Units:** ug/L

**QC Type:** MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec | # | MSD Conc | MSD Rec | # | RPD | # | RPD Limit | Rec Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | 10 | 0 | 7.42 | 74.2 | | 7.76 | 77.6 | | 4.48 | | 20 | 63 - 121 |
| 2,4,6-Trinitrotoluene | 10 | 0 | 9.2 | 92 | | 8.42 | 84.2 | | 8.85 | | 20 | 62 - 125 |
| 2,4-Dinitrotoluene | 10 | 0 | 9.4 | 94 | | 9.8 | 98 | | 4.17 | | 20 | 71 - 119 |
| 2,6-Dinitrotoluene | 10 | 0 | 9.24 | 92.4 | | 9.24 | 92.4 | | 0 | | 20 | 70 - 114 |
| 2-Amino-4,6-dinitrotoluene | 10 | 0 | 8.96 | 89.6 | | 9 | 90 | | .445 | | 20 | 68 - 124 |
| 4-Amino-2,6-dinitrotoluene | 10 | 0 | 10 | 100 | | 10.4 | 104 | | 3.14 | | 20 | 63 - 133 |
| HMX | 10 | 0 | 9.68 | 96.8 | | 9.64 | 96.4 | | .414 | | 20 | 47 - 129 |
| Nitrobenzene | 10 | 0 | 5.5 | 55 | * | 5.74 | 57.4 | | 4.27 | | 20 | 57 - 112 |
| PETN | 10 | 0 | 10.3 | 103 | | 8.28 | 82.8 | | 21.6 | * | 20 | 57 - 121 |
| RDX | 10 | .0398 | 8.2 | 81.6 | | 9.52 | 94.8 | | 14.9 | | 20 | 57 - 136 |
| Tetryl | 10 | 0 | 6.8 | 68 | | 5.98 | 59.8 | | 12.8 | | 60 | 36 - 115 |
| m-Dinitrobenzene | 10 | 0 | 9.62 | 96.2 | | 9.5 | 95 | | 1.26 | | 20 | 69 - 123 |
| m-Nitrotoluene | 10 | 0 | 6.3 | 63 | | 6.52 | 65.2 | | 3.43 | | 20 | 58 - 113 |
| o-Nitrotoluene | 10 | 0 | 5.36 | 53.6 | * | 5 | 50 | * | 6.95 | | 20 | 56 - 113 |
| p-Nitrotoluene | 10 | 0 | 6.26 | 62.6 | | 6.08 | 60.8 | | 2.92 | | 20 | 58 - 114 |

#Column to be used to flag recovery and RPD values with an asterisk

# High Explosives MS/MSD Summary

**Lab Name:** GEL Laboratories LLC

**Client ID:** WSTMO-14-86605

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Extract Batch Code:** 1433022

**Date Extracted:** 05-NOV-14

**GEL Spike ID:** 1203201689

**GEL SpikeDup ID:** 1203201690

**Analysis Date/Time:** 20-NOV-14 15:57

**MSD Analysis Date/Time:** 20-NOV-14 16:14

**Reporting Units:** ug/L

**QC Type:** MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec | # | MSD Conc | MSD Rec | # | RPD | # | RPD Limit | Rec Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 10 | 0 | 8.62 | 86.2 | | 8.54 | 85.4 | | .932 | | 20 | 54 - 120 |
| 2,6-Diamino-4-nitrotoluene | 10 | 0 | 9.1 | 91 | | 8.66 | 86.6 | | 4.96 | | 20 | 58 - 117 |
| 3,5-Dinitroaniline | 10 | 0 | 8.68 | 86.8 | | 8.72 | 87.2 | | .46 | | 20 | 68 - 120 |
| TATB | 10 | 1.37 | 14 | 126 | | 14.5 | 132 | | 3.78 | | 20 | 20 - 147 |
| tris(o-cresyl) phosphate | 10 | 0 | 4.1 | 41 | * | 4.2 | 42 | * | 2.41 | | 20 | 44 - 92 |

#Column to be used to flag recovery and RPD values with an asterisk

# Quality Control Data

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201687

**Sample Amount** 1000 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128066.wiff

**Date Analyzed:** 30-NOV-14 02:49

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.250 | U | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.250 | QU | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.250 | QU | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.250 | U | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.250 | QU | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.500 | U | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201687

**Sample Amount** 1000 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.500 | U | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.500 | U | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201687

**Sample Amount** 1000 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS11200014.wiff

**Date Analyzed:** 20-NOV-14 14:17

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.00 | U | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.00 | U | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.00 | U | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.50 | QU | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.50 | QU | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201688

**Sample Amount** 1000 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128067.wiff

**Date Analyzed:** 30-NOV-14 03:24

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 98-95-3 | Nitrobenzene | 3.67 | Q | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 479-45-8 | Tetryl | 3.75 | | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |
| 88-72-2 | o-Nitrotoluene | 3.84 | | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 3.89 | | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-99-0 | p-Nitrotoluene | 3.91 | | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.08 | | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.25 | | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.34 | | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.4 | | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 78-11-5 | PETN | 4.46 | | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.53 | | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 4.58 | | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.85 | Q | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201688

**Sample Amount** 1000 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 99-65-0 | m-Dinitrobenzene | 5.17 | | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 2691-41-0 | HMX | 6.03 | Q | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201688

**Sample Amount** 1000 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS11200015.wiff

**Date Analyzed:** 20-NOV-14 14:34

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 3.49 | | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 3.86 | Q | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 3.97 | | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.44 | Q | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 3058-38-6 | TATB | 5.85 | | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201689

**Sample Amount** 500 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128075.wiff

**Date Analyzed:** 30-NOV-14 08:04

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 88-72-2 | o-Nitrotoluene | 5.36 | Q | 0.164 | 0.500 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 5.5 | Q | 0.160 | 0.500 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-99-0 | p-Nitrotoluene | 6.26 | | 0.300 | 1.00 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 6.3 | | 0.160 | 0.500 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 479-45-8 | Tetryl | 6.8 | | 0.160 | 1.00 |
| *479-45-8* | *Tetryl* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 7.42 | | 0.160 | 0.500 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 121-82-4 | RDX | 8.2 | Q | 0.160 | 0.500 |
| *121-82-4* | *RDX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 8.96 | | 0.160 | 0.500 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 9.2 | | 0.160 | 0.500 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 9.24 | | 0.160 | 0.500 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 9.4 | | 0.160 | 0.500 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 9.62 | | 0.160 | 0.500 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 2691-41-0 | HMX | 9.68 | Q | 0.160 | 0.500 |
| *2691-41-0* | *HMX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201689

**Sample Amount** 500 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 10 | Q | 0.160 | 0.500 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 78-11-5 | PETN | 10.3 | Q | 0.200 | 1.00 |
| *78-11-5* | *PETN* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201689

**Sample Amount** 500 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS11200020.wiff

**Date Analyzed:** 20-NOV-14 15:57

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 4.1 | | 0.600 | 2.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 8.62 | Q | 1.00 | 5.00 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 8.68 | | 0.600 | 2.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 9.1 | Q | 1.00 | 5.00 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 3058-38-6 | TATB | 14 | | 0.600 | 2.00 |
| *3058-38-6* | *TATB* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201690

**Sample Amount** 500 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128076.wiff

**Date Analyzed:** 30-NOV-14 08:39

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 88-72-2 | o-Nitrotoluene | 5 | Q | 0.164 | 0.500 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 5.74 | Q | 0.160 | 0.500 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 479-45-8 | Tetryl | 5.98 | | 0.160 | 1.00 |
| *479-45-8* | *Tetryl* | | | | |
| 99-99-0 | p-Nitrotoluene | 6.08 | | 0.300 | 1.00 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 6.52 | | 0.160 | 0.500 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 7.76 | | 0.160 | 0.500 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 78-11-5 | PETN | 8.28 | Q | 0.200 | 1.00 |
| *78-11-5* | *PETN* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 8.42 | | 0.160 | 0.500 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 9 | | 0.160 | 0.500 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 9.24 | | 0.160 | 0.500 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 9.5 | | 0.160 | 0.500 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 121-82-4 | RDX | 9.52 | Q | 0.160 | 0.500 |
| *121-82-4* | *RDX* | | | | |
| 2691-41-0 | HMX | 9.64 | Q | 0.160 | 0.500 |
| *2691-41-0* | *HMX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201690

**Sample Amount** 500 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 121-14-2 | 2,4-Dinitrotoluene | 9.8 | | 0.160 | 0.500 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 10.4 | Q | 0.160 | 0.500 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-187

**Matrix:** WATER

**GEL Sample ID:** 1203201690

**Sample Amount** 500 mL

**Date Received:** 31-OCT-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS11200021.wiff

**Date Analyzed:** 20-NOV-14 16:14

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 4.2 | | 0.600 | 2.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 8.54 | Q | 1.00 | 5.00 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 8.66 | Q | 1.00 | 5.00 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 8.72 | | 0.600 | 2.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 3058-38-6 | TATB | 14.5 | | 0.600 | 2.00 |
| *3058-38-6* | *TATB* | | | | |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 28-NOV-14 12:57

**GEL Data File:** EXP1128001.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 28-NOV-14 13:32

**GEL Data File:** EXP1128002.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 20-NOV-14 10:40

**GEL Data File:** EXS11200001.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 3.13 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.55 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 20-NOV-14 10:57

**GEL Data File:** EXS11200002.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | .898 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 28-NOV-14 17:37

**GEL Data File:** EXP1128009.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 28-NOV-14 18:47

**GEL Data File:** EXP1128011.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 28-NOV-14 22:17

**GEL Data File:** EXP1128017.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 29-NOV-14 02:22

**GEL Data File:** EXP1128024.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK06

**Analysis Date:** 29-NOV-14 06:26

**GEL Data File:** EXP1128031.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 3.57 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 29-NOV-14 08:46

**GEL Data File:** EXP1128035.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 1.85 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK08

**Analysis Date:** 29-NOV-14 09:56

**GEL Data File:** EXP1128037.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK09

**Analysis Date:** 29-NOV-14 12:51

**GEL Data File:** EXP1128042.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 1.05 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK10

**Analysis Date:** 29-NOV-14 15:10

**GEL Data File:** EXP1128046.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 1.6 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK11

**Analysis Date:** 29-NOV-14 17:30

**GEL Data File:** EXP1128050.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK12

**Analysis Date:** 29-NOV-14 23:20

**GEL Data File:** EXP1128060.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK13

**Analysis Date:** 30-NOV-14 02:15

**GEL Data File:** EXP1128065.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK14

**Analysis Date:** 30-NOV-14 06:54

**GEL Data File:** EXP1128073.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK15

**Analysis Date:** 30-NOV-14 14:29

**GEL Data File:** EXP1128086.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 20-NOV-14 13:10

**GEL Data File:** EXS11200010.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 11.2 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 2.75 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 20-NOV-14 13:44

**GEL Data File:** EXS11200012.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 6.5 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.6 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-187

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 20-NOV-14 17:21

**GEL Data File:** EXS11200025.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 5.63 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.73 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 10-DEC-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LC-MS/MS | SW846 3535/8321A Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1433023 | See Below | | |

**Potentially affected work order(s)(SDG):** **360220(2015-187),360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189),360424(2015-204),360425(2015-207),360431(2015-208)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Low Level Calibration Verification Standard EXP1128087 did not meet acceptance criteria of 70-130% for the recovery of HMX at 130.3% and PETN at 138%.<br><br>2. Low Level Calibration Verification Standard EXS1128026 did not meet acceptance criteria of 70-130% for the recovery of 2,6-Diamino-4-nitrotoluene at 65.5% and 2,4-Diamino-6-nitrotoluene at 52.4%.<br><br>3. The LCS (1203201688) did not meet acceptance criteria for the recovery of HMX at 121%. The limits are 61-118%.<br><br>4. The MS (1203201689) did not meet acceptance criteria for the recovery of multiple target analytes. Please refer to Form 3 of the data package for a complete list of recoveries.<br><br>5. The MSD (1203201690) did not meet acceptance criteria for the recovery of multiple target analytes. Please refer to Form 3 of the data package for a complete list of recoveries.<br><br>6. The MS/MSD pair (1203201689/1203201690) did not meet RPD acceptance criteria for PETN at 21.6%. The limits are 0-20%. | 1. The biased high recoveries are an indication that the instrument had more than the required sensitivity to detect the target analytes. Since these target analytes were not detected in the associated samples, the data are considered unaffected. The data are Q qualified and reported with the appropriate DER. The discrepancies are noted in the Case Narrative.<br><br>2. The biased low CRI recoveries were confirmed by re-analysis. The data from the first analysis are Q qualified and reported with the appropriate DER. The confirmation raw data are located in the Miscellaneous section of the data package. The discrepancies are noted in the Case Narrative.<br><br>3. Since the HMX recovery was biased high and HMX was not detected in the associated samples, the data are considered unaffected and are reported with the appropriate DER.<br><br>4. The MSD (1203201690) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.<br><br>5. The MS (1203201689) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.<br><br>6. Both the MS (1203201689) and MSD (1203201690) recoveries for PETN met acceptance criteria. Since PETN was not detected in the parent sample, 360288007 (WSTMO-14-8660), the data are considered unaffected and are reported with the appropriate DER. |

**Originator's Name:**

Lynne Russell 10-DEC-14

**Data Validator/Group Leader:**

Michael Penny 11-DEC-14

# PCB Analysis

# Case Narrative

**PCB Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-187**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Polychlorinated Biphenyls by ECD** |
| Analytical Method: | SW846 3535A/8082 |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1435829 |
| Prep Batch Number: | 1435828 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

| Sample ID | Client ID |
|---|---|
| 360220001 | CAWR-14-89228 |
| 360220004 | CAWR-14-89231 |
| 1203208929 | MB for batch 1435828 |
| 1203208930 | Laboratory Control Sample (LCS) |
| 1203208933 | Laboratory Control Sample Duplicate (LCSD) |
| 1203208931 | 360288004(WSTMO-14-86605) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria for the target analytes. All analytes were within the established retention time windows for this method.

Surrogate recovery did not meet the acceptance criteria in the standard analyzed for this SDG; however, this had no adverse effects on the data as the associated ARSL samples recovered well within the acceptance limits for the surrogate.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
ARSL sample 360288004 (WSTMO-14-86605) of similar matrix was selected for the matrix spike analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were not within the established acceptance limits due to sample matrix interference.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions were not performed in this SDG in this batch.

## Miscellaneous Information

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS are from the same analytical column as the parent sample. The data reported for the LCSD are from the same analytical column as the LCS.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

**System Configuration**

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD2A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD2A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-187  GEL Work Order: 360220

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Jimi Cao  **Name: Jimin Cao**

**Date: 19 NOV 2014**  **Title: Data Validator**

# Sample Data Summary

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 13:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220001** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89228** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1435829** | **Inst:** | **ECD2A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 17:28** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/13/2014 07:10** | **Aliquot:** | **990 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **111314.S\E2k1331.D** | **Column:** | **1 Rtx-CLP I** | | |
| | **111314.S\E2k1331.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.221 | 0.202 | ug/L | 110 | (33%-125%) |
| 4cmx | 0.171 | 0.202 | ug/L | 84.4 | (33%-102%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 10:00** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360220004** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **CAWR-14-89231** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1435829** | **Inst:** | **ECD2A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 17:44** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/13/2014 07:10** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **111314.S\E2k1332.D** | **Column:** | **1 Rtx-CLP I** | | |
| | **111314.S\E2k1332.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.104 | ug/L | 0.0347 | 0.104 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.176 | 0.208 | ug/L | 84.4 | (33%-102%) |
| Decachlorobiphenyl | 0.244 | 0.208 | ug/L | 117 | (33%-125%) |

# Quality Control Summary

**PCB**

## Surrogate Recovery Report

**SDG Number: 2015-187**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|---|---|---|---|---|---|
| 1203208929 | MB for batch 1435828 | 54 | 54 | 70 | 70 |
| 1203208930 | LCS for batch 1435828 | 74 | 75 | 100 | 98 |
| 1203208933 | LCSD for batch 1435828 | 78 | 80 | 101 | 102 |
| 360220001 | CAWR-14-89228 | 81 | 84 | 110 | 109 |
| 360220004 | CAWR-14-89231 | 82 | 84 | 115 | 117 |
| 1203208931 | WSTMO-14-86605MS | 6 * D | 5 * D | 4 * D | 3 * D |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 4CMX | = 4cmx | (33%-102%) |
| DCB | = Decachlorobiphenyl | (33%-125%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCS for batch 1435828**
**Lab Sample ID** **1203208930**
**Instrument:** **ECD2A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 12:56**
**Dilution: 1**
**Prep Batch ID:** **1435828**
**Batch ID:** **1435829**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCS | Aroclor-1016 | 1.00 | 0.0 | 0.732 | 73 | 47-105 |
| 11096-82-5 | LCS | Aroclor-1260 | 1.00 | 0.0 | 0.797 | 80 | 45-108 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **LCSD for batch 1435828**
**Lab Sample ID** **1203208933**
**Instrument:** **ECD2A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 13:09**
**Dilution: 1**
**Prep Batch ID:** **1435828**
**Batch ID:** **1435829**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCSD Aroclor-1016 | 1.00 | 0.0 | 0.751 | 75 | 47-105 | 3 | 0-30 |
| 11096-82-5 | LCSD Aroclor-1260 | 1.00 | 0.0 | 0.819 | 82 | 45-108 | 3 | 0-30 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-187**
**Client ID:** **WSTMO-14-86605MS**
**Lab Sample ID** **1203208931**
**Instrument:** **ECD2A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 10:36**
**Prep Batch ID:** **1435828**
**Batch ID:** **1435829**
**Dilution:** **5**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MS | Aroclor-1016 | 2.00 | 0.00 | U | 0.00 | 0 * | 32-108 |
| 11096-82-5 | MS | Aroclor-1260 | 2.00 | 0.00 | U | 0.00 | 0 * | 29-110 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1435828** | **Instrument ID:** | **ECD2A.I_1**<br>**ECD2A.I_2** | **Data File:** | **111314.S\E2k1312.D**<br>**111314.S\E2k1312.D** |
| **Lab Sample ID:** | **1203208929** | | | | |
| **Column:** | **Rtx-CLP I**<br>**CLPesticides2** | **Prep Date:** | **11/13/2014 07:10** | **Analyzed:** | **11/13/14 12:42** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1435828** | **1203208930** | **111314.S\E2k1313.D**<br>**111314.S\E2k1313.D** | **11/13/14** | **1256** |
| **02 LCSD for batch 1435828** | **1203208933** | **111314.S\E2k1314.D**<br>**111314.S\E2k1314.D** | **11/13/14** | **1309** |
| **03 CAWR-14-89228** | **360220001** | **111314.S\E2k1331.D**<br>**111314.S\E2k1331.D** | **11/13/14** | **1728** |
| **04 CAWR-14-89231** | **360220004** | **111314.S\E2k1332.D**<br>**111314.S\E2k1332.D** | **11/13/14** | **1744** |
| **05 WSTMO-14-86605MS** | **1203208931** | **111414.S\E2k1413.D**<br>**111414.S\E2k1413.D** | **11/14/14** | **1036** |

# Quality Control Data

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203208929** | | | | |
| **Client Sample:** | **QC for batch 1435828** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1435828** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1435829** | **Inst:** | **ECD2A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 12:42** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/13/2014 07:10** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **111314.S\E2k1312.D** | **Column:** | **1 Rtx-CLP I** | | |
| | **111314.S\E2k1312.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.109 | 0.200 | ug/L | 54.4 | (33%-102%) |
| Decachlorobiphenyl | 0.140 | 0.200 | ug/L | 69.8 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203208930** | | | | |
| **Client Sample:** | **QC for batch 1435828** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1435828** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1435829** | **Inst:** | **ECD2A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 12:56** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/13/2014 07:10** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **111314.S\E2k1313.D** | **Column:** | **1 Rtx-CLP I** | | |
| | **111314.S\E2k1313.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.732 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.797 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.199 | 0.200 | ug/L | 99.7 | (33%-125%) |
| 4cmx | 0.150 | 0.200 | ug/L | 75.2 | (33%-102%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | **Date Collected:** | **10/29/2014 09:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203208931** | **Date Received:** | **10/31/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1435828** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WSTMO-14-86605MS** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1435829** | **Inst:** | **ECD2A.I** | **Dilution:** | **5** |
| **Run Date:** | **11/14/2014 10:36** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/13/2014 07:10** | **Aliquot:** | **500 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **111414.S\E2k1413.D** | **Column:** | **1 Rtx-CLP I** | | |
| | **111414.S\E2k1413.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 1.00 | ug/L | 0.333 | 1.00 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 1.00 | ug/L | 0.333 | 1.00 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 1.00 | ug/L | 0.333 | 1.00 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 1.00 | ug/L | 0.333 | 1.00 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 1.00 | ug/L | 0.333 | 1.00 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 1.00 | ug/L | 0.333 | 1.00 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 1.00 | ug/L | 0.333 | 1.00 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 1.00 | ug/L | 0.333 | 1.00 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | | Acceptable Limits |
|---|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.200 | 0.400 | ug/L | 3.93 | * | (33%-125%) |
| 4cmx | 0.0218 | 0.400 | ug/L | 5.45 | * | (33%-102%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-187** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203208933** | | | | |
| **Client Sample:** | **QC for batch 1435828** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1435828** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1435829** | **Inst:** | **ECD2A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 13:09** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/13/2014 07:10** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **111314.S\E2k1314.D** | **Column:** | **1 Rtx-CLP I** | | |
| | **111314.S\E2k1314.D** | | **2 CLPesticides2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.751 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.819 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decachlorobiphenyl | 0.201 | 0.200 | ug/L | 101 | (33%-125%) |
| 4cmx | 0.159 | 0.200 | ug/L | 79.6 | (33%-102%) |

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-187**

| **Sample ID** | **Client ID** |
|---|---|
| 360220006 | CAWR-14-89231 |
| 360220007 | CAWR-14-89235 |
| 1203200491 | Method Blank (MB)**ICP** |
| 1203200492 | Laboratory Control Sample (LCS) |
| 1203200496 | 360220007(CAWR-14-89235L) Serial Dilution (SD) |
| 1203200493 | 360220007(CAWR-14-89235D) Sample Duplicate (DUP) |
| 1203200494 | 360220007(CAWR-14-89235S) Matrix Spike (MS) |
| 1203200561 | Method Blank (MB)**ICP-MS** |
| 1203200562 | Laboratory Control Sample (LCS) |
| 1203200565 | 360220007(CAWR-14-89235L) Serial Dilution (SD) |
| 1203200563 | 360220007(CAWR-14-89235D) Sample Duplicate (DUP) |
| 1203200564 | 360220007(CAWR-14-89235S) Matrix Spike (MS) |
| 1203208387 | Method Blank (MB)**CVAA** |
| 1203208388 | Laboratory Control Sample (LCS) |
| 1203208391 | 360759001(WST05-15-90481L) Serial Dilution (SD) |
| 1203208389 | 360759001(WST05-15-90481D) Sample Duplicate (DUP) |
| 1203208390 | 360759001(WST05-15-90481S) Matrix Spike (MS) |

**Sample Analysis**

**Method/Analysis Information**

| | |
|---|---|
| **Analytical Batch:** | 1432513, 1432537, 1435631 and 1437813 |
| **Prep Batch :** | 1432512, 1432536 and 1435624 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 11, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 28 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**System Configuration**

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray

chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1600W power, 16 L/m for the plasma, and 1.2 L/m auxiliary gases, and 1.12 L/min carrier gas flow.

## Calibration Information

### Instrument Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

### CRDL/PQL Requirements
The PQL standard recoveries for SW846 6010C met the control limits with the exception of potassium. Sample 360220007 (CAWR-14-89235)-ICP was affected. Client sample concentrations were greater than two times the PQL; therefore the data were not adversely affected. The CRDL standard recoveries for SW846 6020A met the advisory control limits with the exception of uranium. Sample 360220007 (CAWR-14-89235)-ICP-MS was affected. Client sample concentrations were greater than two times the PQL; therefore the data were not adversely affected.

### ICSA/ICSAB Statement
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

### Continuing Calibration Blanks (CCB) Requirements
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

### Continuing Calibration Verification (CCV) Requirements
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

## Quality Control (QC) Information

### Method Blank (MB) Statement
The MBs analyzed with this SDG met the acceptance criteria.

### Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

### Quality Control (QC) Sample Statement
The following samples were selected as the quality control (QC) samples for this SDG: 360220007 (CAWR-14-89235)-ICP and ICP-MS and 360759001 (WST05-15-90481)-CVAA.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

**Preparation Information**
The samples in this SDG were prepared exactly according to the cited SOP.

**Miscellaneous Information**

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

**Additional Comments**
Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-187  GEL Work Order: 360220

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

J Value is estimated

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Pat Steele **Name: Patricia Steele**

**Date: 26 NOV 2014** **Title: Data Validator**

# Sample Data Summary

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−187 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

**SAMPLE ID:** 360220006 **BASIS:** As Received **DATE COLLECTED** 29−OCT−14

**CLIENT ID:** CAWR−14−89231 **LEVEL:** Low **DATE RECEIVED** 31−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 11/13/14 11:02 | 111314W1−5 | 1435631 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1435631 | 1435624 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/12/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−187 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

**SAMPLE ID:** 360220007 **BASIS:** As Received **DATE COLLECTED** 29−OCT−14

**CLIENT ID:** CAWR−14−89235 **LEVEL:** Low **DATE RECEIVED** 31−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 11/13/14 11:04 | 111314W1−5 | 1435631 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2015−187 **CONTRACT:** ESHL00114 **METHOD TYPE:** SW846

**SAMPLE ID:** 360220007 **BASIS:** As Received **DATE COLLECTED** 29−OCT−14

**CLIENT ID:** CAWR−14−89235 **LEVEL:** Low **DATE RECEIVED** 31−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7440−38−2 | Arsenic | 4.13 | ug/L | J | 1.7 | 5 | 5 | 1 | MS | BAJ | 11/24/14 16:15 | 141124−2 | 1432537 |
| 7440−39−3 | Barium | 23.4 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−42−8 | Boron | 41.2 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7440−70−2 | Calcium | 14600 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−47−3 | Chromium | 3.6 | ug/L | J | 2 | 10 | 10 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7439−89−6 | Iron | 55.1 | ug/L | J | 30 | 100 | 100 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7439−95−4 | Magnesium | 702 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7439−96−5 | Manganese | 9.41 | ug/L | J | 2 | 10 | 10 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7439−98−7 | Molybdenum | 3.14 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7440−02−0 | Nickel | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | SKJ | 11/20/14 14:20 | 141120−4 | 1432537 |
| 7440−09−7 | Potassium | 2130 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7631−86−9 | Silica | 31600 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7440−23−5 | Sodium | 39600 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−24−6 | Strontium | 186 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7440−31−5 | Tin | 10 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−61−1 | Uranium | 3.08 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | SKJ | 11/19/14 20:05 | 141119−3 | 1432537 |
| 7440−62−2 | Vanadium | 26.6 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |
| 7440−66−6 | Zinc | 5.61 | ug/L | J | 3.3 | 10 | 10 | 1 | P | HSC | 11/05/14 09:14 | 110514−1 | 1432513 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−187 **CONTRACT:** ESHL00114 **METHOD TYPE:**

**SAMPLE ID:** 360220007 **BASIS:** As Received **DATE COLLECTED** 29−OCT−14

**CLIENT ID:** CAWR−14−89235 **LEVEL:** Low **DATE RECEIVED** 31−OCT−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 39.3 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/20/14 08:35 | | 1437813 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1432513 | 1432512 | SW846 3005A | 50 | mL | 50 | mL | 11/03/14 | JXM5 |
| 1432537 | 1432536 | SW846 3005A | 50 | mL | 50 | mL | 11/03/14 | JXM5 |
| 1435631 | 1435624 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/12/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2015−187

**Contract:** ESHL00114

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203200491 | | | | | | | | |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Potassium | 54.3 | ug/L | +/−150 | J | P | 50 | 150 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Sodium | 100 | ug/L | +/−300 | U | P | 100 | 300 |
| | Strontium | −1.18 | ug/L | +/−5 | J | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Zinc | 5.31 | ug/L | +/−10 | J | P | 3.3 | 10 |
| 1203200561 | | | | | | | | |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.073 | ug/L | +/−0.2 | J | MS | 0.067 | 0.2 |
| 1203208387 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−187 **Client ID** CAWR−14−89235S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 360220007 **Spike ID:** 1203200494

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 4800 | | 68 | U | 5000 | 94.8 | | P |
| Barium | ug/L | 75−125 | 506 | | 23.4 | | 500 | 96.5 | | P |
| Beryllium | ug/L | 75−125 | 490 | | 1 | U | 500 | 98 | | P |
| Boron | ug/L | 75−125 | 513 | | 41.2 | J | 500 | 94.3 | | P |
| Calcium | ug/L | 75−125 | 19400 | | 14600 | | 5000 | 96.1 | | P |
| Cobalt | ug/L | 75−125 | 490 | | 1 | U | 500 | 97.9 | | P |
| Copper | ug/L | 75−125 | 512 | | 3 | U | 500 | 102 | | P |
| Iron | ug/L | 75−125 | 4810 | | 55.1 | J | 5000 | 95 | | P |
| Magnesium | ug/L | 75−125 | 5480 | | 702 | | 5000 | 95.6 | | P |
| Manganese | ug/L | 75−125 | 506 | | 9.41 | J | 500 | 99.2 | | P |
| Potassium | ug/L | 75−125 | 6930 | | 2130 | | 5000 | 95.9 | | P |
| Silica | ug/L | 75−125 | 42300 | | 31600 | | 10700 | 100 | | P |
| Sodium | ug/L | | 44100 | | 39600 | | 5000 | 89.2 | N/A | P |
| Strontium | ug/L | 75−125 | 677 | | 186 | | 500 | 98.2 | | P |
| Tin | ug/L | 75−125 | 521 | | 2.5 | U | 500 | 104 | | P |
| Vanadium | ug/L | 75−125 | 550 | | 26.6 | | 500 | 105 | | P |
| Zinc | ug/L | 75−125 | 498 | | 5.61 | J | 500 | 98.5 | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−187 **Client ID** CAWR−14−89235S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 360220007 **Spike ID:** 1203200564

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | 75−125 | 52.6 | | 1 | U | 50 | 104 | | MS |
| Arsenic | ug/L | 75−125 | 55.2 | | 4.13 | J | 50 | 102 | | MS |
| Cadmium | ug/L | 75−125 | 52.7 | | 0.11 | U | 50 | 105 | | MS |
| Chromium | ug/L | 75−125 | 58 | | 3.6 | J | 50 | 109 | | MS |
| Lead | ug/L | 75−125 | 51 | | 0.5 | U | 50 | 102 | | MS |
| Molybdenum | ug/L | 75−125 | 55.5 | | 3.14 | | 50 | 105 | | MS |
| Nickel | ug/L | 75−125 | 57.7 | | 0.5 | U | 50 | 115 | | MS |
| Selenium | ug/L | 75−125 | 50 | | 1.5 | U | 50 | 99.2 | | MS |
| Silver | ug/L | 75−125 | 52.9 | | 0.2 | U | 50 | 106 | | MS |
| Thallium | ug/L | 75−125 | 50.8 | | 0.45 | U | 50 | 101 | | MS |
| Uranium | ug/L | 75−125 | 57.2 | | 3.08 | | 50 | 108 | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−187 **Client ID** WST05−15−90481S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 360759001 **Spike ID:** 1203208390

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 1.89 | | 0.067 | U | 2 | 94.3 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−187 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** CAWR−14−89235D

**Matrix:** WATER **Level:** Low

**Sample ID:** 360220007 **Duplicate ID:** 1203200493 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−5 | 23.4 | | 22.9 | | 2.34 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | +/−50 | 41.2 | J | 40.9 | J | .68 | | P |
| Calcium | ug/L | +/−20% | 14600 | | 14500 | | .812 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | +/−100 | 55.1 | J | 57.7 | J | 4.65 | | P |
| Magnesium | ug/L | +/−300 | 702 | | 684 | | 2.59 | | P |
| Manganese | ug/L | +/−10 | 9.41 | J | 9.22 | J | 1.95 | | P |
| Potassium | ug/L | +/−20% | 2130 | | 2100 | | 1.48 | | P |
| Silica | ug/L | +/−20% | 31600 | | 31300 | | .905 | | P |
| Sodium | ug/L | +/−20% | 39600 | | 38900 | | 1.87 | | P |
| Strontium | ug/L | +/−20% | 186 | | 185 | | .772 | | P |
| Tin | ug/L | | 2.5 | U | 2.5 | U | | | P |
| Vanadium | ug/L | +/−20% | 26.6 | | 26.2 | | 1.55 | | P |
| Zinc | ug/L | +/−10 | 5.61 | J | 4.99 | J | 11.7 | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−187 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** CAWR−14−89235D

**Matrix:** WATER **Level:** Low

**Sample ID:** 360220007 **Duplicate ID:** 1203200563 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | +/−5 | 4.13 | J | 3.69 | J | 11.2 | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | +/−10 | 3.6 | J | 2.49 | J | 36.7 | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−20% | 3.14 | | 3.05 | | 3.07 | | MS |
| Nickel | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−20% | 3.08 | | 3.04 | | 1.21 | | MS |

***Analytical Methods:**

**MS SW846 3005A/6020A**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−187 **Lab Code:** GEL

**Contract:** ESHL00114 **Client ID:** WST05−15−90481D

**Matrix:** WATER **Level:** Low

**Sample ID:** 360759001 **Duplicate ID:** 1203208389 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−187

**Contract:** ESHL00114

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203200492 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 4870 | | 97.4 | 80−120 | P |
| | Barium | ug/L | 500 | 487 | | 97.4 | 80−120 | P |
| | Beryllium | ug/L | 500 | 487 | | 97.4 | 80−120 | P |
| | Boron | ug/L | 500 | 467 | | 93.5 | 80−120 | P |
| | Calcium | ug/L | 5000 | 4980 | | 99.7 | 80−120 | P |
| | Cobalt | ug/L | 500 | 492 | | 98.4 | 80−120 | P |
| | Copper | ug/L | 500 | 507 | | 101 | 80−120 | P |
| | Iron | ug/L | 5000 | 4820 | | 96.4 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 4970 | | 99.3 | 80−120 | P |
| | Manganese | ug/L | 500 | 511 | | 102 | 80−120 | P |
| | Potassium | ug/L | 5000 | 5030 | | 101 | 80−120 | P |
| | Silica | ug/L | 10700 | 10600 | | 98.6 | 80−120 | P |
| | Sodium | ug/L | 5000 | 5290 | | 106 | 80−120 | P |
| | Strontium | ug/L | 500 | 504 | | 101 | 80−120 | P |
| | Tin | ug/L | 500 | 527 | | 105 | 80−120 | P |
| | Vanadium | ug/L | 500 | 525 | | 105 | 80−120 | P |
| | Zinc | ug/L | 500 | 498 | | 99.7 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−187

**Contract:** ESHL00114

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203200562 | | | | | | | | |
| | Antimony | ug/L | 50 | 51.9 | | 104 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 52.1 | | 104 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 52 | | 104 | 80−120 | MS |
| | Chromium | ug/L | 50 | 54.3 | | 109 | 80−120 | MS |
| | Lead | ug/L | 50 | 51.7 | | 103 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 51.6 | | 103 | 80−120 | MS |
| | Nickel | ug/L | 50 | 55.4 | | 111 | 80−120 | MS |
| | Selenium | ug/L | 50 | 51.6 | | 103 | 80−120 | MS |
| | Silver | ug/L | 50 | 52.8 | | 106 | 80−120 | MS |
| | Thallium | ug/L | 50 | 50.8 | | 102 | 80−120 | MS |
| | Uranium | ug/L | 50 | 53.6 | | 107 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−187

**Contract:** ESHL00114

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203208388 | | | | | | | | |
| | Mercury | ug/L | 2 | 2.02 | | 101 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−187 **Client ID** CAWR−14−89235L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 360220007 **Serial Dilution ID:** 1203200496

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 23.4 | | 23.7 | J | 1.19 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 41.2 | J | 75 | U | 100 | | | P |
| Calcium | 14600 | | 14900 | | 2.19 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 55.1 | J | 150 | U | 100 | | | P |
| Magnesium | 702 | | 738 | J | 5.08 | | | P |
| Manganese | 9.41 | J | 10.2 | J | 7.99 | | | P |
| Potassium | 2130 | | 2410 | | 13 | | | P |
| Silica | 31600 | | 31400 | | .61 | | 10 | P |
| Sodium | 39600 | | 40900 | | 3.34 | | 10 | P |
| Strontium | 186 | | 188 | | 1.01 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 26.6 | | 27.1 | | 1.79 | | | P |
| Zinc | 5.61 | J | 16.5 | U | 100 | | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−187 **Client ID** CAWR−14−89235L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 360220007 **Serial Dilution ID:** 1203200565

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 4.13 | J | 8.5 | U | 100 | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 3.6 | J | 10 | U | 100 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | 3.14 | | 3.72 | | 18.2 | | | MS |
| Nickel | .5 | U | 2.5 | U | | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | 3.08 | | 3.23 | | 5.04 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−187 **Client ID** WST05−15−90481L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 360759001 **Serial Dilution ID:** 1203208391

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-187**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1435687 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203208550 | Method Blank (MB) |
| 1203208551 | Laboratory Control Sample (LCS) |
| 1203208552 | 359946012(CAPA-14-87201) Sample Duplicate (DUP) |
| 1203208553 | 360755004(CAMO-15-90216) Sample Duplicate (DUP) |
| 1203208554 | 359946012(CAPA-14-87201) Post Spike (PS) |
| 1203208555 | 360755004(CAMO-15-90216) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 359946012 (CAPA-14-87201) and 360755004 (CAMO-15-90216).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1432348 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1432347 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203200097 | Method Blank (MB) |
| 1203200098 | Laboratory Control Sample (LCS) |
| 1203200100 | 360117010(CAPA-14-87192) Sample Duplicate (DUP) |
| 1203200103 | 360117010(CAPA-14-87192) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360117010 (CAPA-14-87192).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203200103 (CAPA-14-87192MS).

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203200100 (CAPA-14-87192DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203200098 (LCS).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1352362. 1203200103 (CAPA-14-87192MS).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1436786 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203211471 | Method Blank (MB) |
| 1203211472 | Laboratory Control Sample (LCS) |
| 1203211473 | 360084003(CAPA-14-89329) Sample Duplicate (DUP) |
| 1203211474 | 361141005(CASA-15-90258) Sample Duplicate (DUP) |
| 1203211475 | 360084003(CAPA-14-89329) Post Spike (PS) |
| 1203211476 | 361141005(CASA-15-90258) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 360084003 (CAPA-14-89329) and 361141005 (CASA-15-90258).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203211476 (CASA-15-90258PS). The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203211476 (CASA-15-90258PS).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203211473 (CAPA-14-89329DUP), 1203211474 (CASA-15-90258DUP), 1203211475 (CAPA-14-89329PS), 1203211476 (CASA-15-90258PS) and 360220007 (CAWR-14-89235).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1432165 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1432164 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203199677 | Method Blank (MB) |
| 1203199678 | Laboratory Control Sample (LCS) |
| 1203201187 | 360220007(CAWR-14-89235) Sample Duplicate (DUP) |
| 1203201188 | 360220007(CAWR-14-89235) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360220007 (CAWR-14-89235).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203201187 (CAWR-14-89235DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203199677 (MB) and 1203199678 (LCS).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1354282. 1203201187 (CAWR-14-89235DUP).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1432167 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1432166 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203199683 | Method Blank (MB) |
| 1203199684 | Laboratory Control Sample (LCS) |
| 1203199685 | 360117010(CAPA-14-87192) Sample Duplicate (DUP) |
| 1203199686 | 360117010(CAPA-14-87192) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360117010 (CAPA-14-87192).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following samples were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 1203199686 (CAPA-14-87192MS) and 360220006 (CAWR-14-89231).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages

electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Method/Analysis Information**

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1432964 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| **Sample ID** | **Client ID** |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203201558 | Method Blank (MB) |
| 1203201559 | Laboratory Control Sample (LCS) |
| 1203201561 | 360298001(WSTMO-14-87592) Sample Duplicate (DUP) |
| 1203201563 | 360298001(WSTMO-14-87592) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**Calibration Information**

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360298001 (WSTMO-14-87592).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203201561 (WSTMO-14-87592DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to matrix interference: 1203201561 (WSTMO-14-87592DUP) and 1203201563 (WSTMO-14-87592PS).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1432171 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1432170 | **Method:** | EEPA 365.4 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203199695 | Method Blank (MB) |
| 1203199696 | Laboratory Control Sample (LCS) |
| 1203199699 | 360117011(CAPA-14-87218) Sample Duplicate (DUP) |
| 1203199700 | 360117011(CAPA-14-87218) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360117011 (CAPA-14-87218).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203199699 (CAPA-14-87218DUP).

## Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following samples were re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203199695 (MB) and 1203199696 (LCS).

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are

present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1432682 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203200886 | Method Blank (MB) |
| 1203200887 | Laboratory Control Sample (LCS) |
| 1203200888 | 360220007(CAWR-14-89235) Sample Duplicate (DUP) |
| 1203200889 | 360285007(CAPA-14-87212) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 360220007 (CAWR-14-89235) and 360285007

(CAPA-14-87212).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203200888 (CAWR-14-89235DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1352039. 1203200888 (CAWR-14-89235DUP).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1433707 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203203372 | Laboratory Control Sample (LCS) |
| 1203203373 | 360285007(CAPA-14-87212) Sample Duplicate (DUP) |
| 1203203374 | 360288001(WSTMO-14-86604) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

**Initial Standardization**
The titrant was properly standardized

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
This batch does not require a method blank.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 360285007 (CAPA-14-87212) and 360288001 (WSTMO-14-86604).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1433708 **Method:** PH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203203393 | Laboratory Control Sample (LCS) |
| 1203203394 | 360288001(WSTMO-14-86604) Sample Duplicate (DUP) |
| 1203203395 | 360285007(CAPA-14-87212) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
This batch does not require a method blank.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 360285007 (CAPA-14-87212) and 360288001 (WSTMO-14-86604).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
The following sample from this sample group was received by the lab outside of the method specified holding time: 360220007 (CAWR-14-89235).

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1354161. 360220007 (CAWR-14-89235).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1435239 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 360220007 | CAWR-14-89235 |
| 1203207405 | Method Blank (MB) |
| 1203207407 | Laboratory Control Sample (LCS) |
| 1203207410 | 360285007(CAPA-14-87212) Sample Duplicate (DUP) |
| 1203207413 | 360285007(CAPA-14-87212) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360285007 (CAPA-14-87212).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:** 11/26/14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-187  GEL Work Order: 360220

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

E  Concentration of the target analyte exceeds the instrument calibration range

H  Analytical holding time was exceeded

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____ 11/26/14

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: November 25, 2014

| | |
|---|---|
| Company : | Los Alamos National Laboratory |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 |
| | Los Alamos, New Mexico 87545 |
| Contact: | Mr. Keith Greene |
| Project: | LANL- WQH Water Samples |

Client SDG: 2015-187

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-89231 | Project: | ESHL00114 |
| Sample ID: | 360220006 | Client ID: | ARSL004 |
| Matrix: | W | | |
| Collect Date: | 29-OCT-14 10:00 | | |
| Receive Date: | 31-OCT-14 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 1.23 | 0.330 | 1.00 | mg/L | 1 | TSM | 11/17/14 | 2039 | 1435687 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 11/06/14 | 0845 | 1432348 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.210 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 11/05/14 | 1317 | 1432167 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 11/05/14 | 1655 | 1432347 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 11/04/14 | 1700 | 1432166 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: November 25, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2015-187

Client Sample ID: CAWR-14-89235
Sample ID: 360220007
Matrix: W
Collect Date: 29-OCT-14 10:00
Receive Date: 31-OCT-14
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | U | ND | 0.067 | 0.200 | mg/L | 1 | RXB5 | 11/16/14 | 1101 | 1436786 | 1 |
| Chloride | | 2.98 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.479 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 7.04 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.127 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 11/11/14 | 1550 | 1432165 | 2 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 0.154 | 0.017 | 0.050 | mg/L | 1 | AXH3 | 11/04/14 | 1601 | 1432964 | 3 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 11/05/14 | 1100 | 1432171 | 4 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 113 | 3.40 | 14.3 | mg/L | | MXB3 | 11/03/14 | 1037 | 1432682 | 5 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 112 | 0.725 | 1.00 | mg/L | | PXO1 | 11/12/14 | 1734 | 1435239 | 6 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 223 | 3.63 | 14.5 | umhos/cm | 1 | PXO1 | 11/05/14 | 1336 | 1433707 | 7 |
| PH "As Received" | | | | | | | | | | | |
| pH at Temp 20.0C | H | 8.07 | 0.010 | 0.100 | SU | 1 | PXO1 | 11/05/14 | 1411 | 1433708 | 8 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | AXH3 | 11/11/14 | 1113 | 1432164 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 11/04/14 | 1700 | 1432170 |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 25, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2015-187 |
| Project: | LANL- WQH Water Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-89235 | Project: | ESHL00114 |
| Sample ID: | 360220007 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 350.1 | |
| 3 | EPA 353.2 | |
| 4 | EPA 365.4 | |
| 5 | EPA 160.1 | |
| 6 | EPA 310.1 | |
| 7 | EPA 120.1 | |
| 8 | EPA 150.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: November 25, 2014



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **360220**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | |
| Batch 1435687 | | | | | | | | | | | |
| QC1203208552 359946012 DUP | | | | | | | | | | | |
| Total Organic Carbon Average | | U | ND | U | ND | mg/L | N/A | | | TSM | 11/17/14 17:38 |
| QC1203208553 360755004 DUP | | | | | | | | | | | |
| Total Organic Carbon Average | | U | ND | U | ND | mg/L | N/A | | | | 11/18/14 03:26 |
| QC1203208551 LCS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 9.47 | mg/L | | 94.7 | (85%-115%) | | 11/17/14 16:23 |
| QC1203208550 MB | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | 11/17/14 16:14 |
| QC1203208554 359946012 PS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | U | ND | | 10.0 | mg/L | | 97.3 | (65%-120%) | | 11/17/14 17:58 |
| QC1203208555 360755004 PS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | U | ND | | 9.99 | mg/L | | 96.9 | (65%-120%) | | 11/18/14 03:46 |
| **Flow Injection Analysis** | | | | | | | | | | | |
| Batch 1432348 | | | | | | | | | | | |
| QC1203200100 360117010 DUP | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | AXH3 | 11/06/14 08:37 |
| QC1203200098 LCS | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 54.8 | ug/L | | 110 | (90%-110%) | | 11/06/14 08:44 |
| QC1203200097 MB | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | 11/06/14 08:32 |
| QC1203200103 360117010 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 115 | ug/L | | 115* | (90%-110%) | | 11/06/14 08:38 |
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1436786 | | | | | | | | | | | |
| QC1203211473 360084003 DUP | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | RXB5 | 11/16/14 08:57 |
| Chloride | | | 1.46 | | 1.45 | mg/L | 0.378 | | (0%-20%) | | |
| Fluoride | | | 0.181 | | 0.184 | mg/L | 1.32 ^ | | (+/-0.100) | | |
| Sulfate | | | 1.61 | | 1.62 | mg/L | 0.211 ^ | | (+/-0.400) | | |

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## QC Summary

**Workorder:** **360220**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1436786 | | | | | | | | | | | |
| QC1203211474 361141005 DUP | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | RXB5 | 11/16/14 20:49 |
| Chloride | | | 6.92 | | 6.93 | mg/L | 0.107 | | (0%-20%) | | |
| Fluoride | | | 0.291 | | 0.303 | mg/L | 4.01 ^ | | (+/-0.100) | | |
| Sulfate | | | 5.70 | | 5.72 | mg/L | 0.420 | | (0%-20%) | | |
| QC1203211472 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.30 | mg/L | | 104 | (90%-110%) | | 11/16/14 06:54 |
| Chloride | 5.00 | | | | 4.90 | mg/L | | 97.9 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.52 | mg/L | | 101 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 10.0 | mg/L | | 100 | (90%-110%) | | |
| QC1203211471 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 11/16/14 06:23 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203211475 360084003 PS | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.36 | mg/L | | 106 | (90%-110%) | | 11/16/14 09:28 |
| Chloride | 5.00 | | 1.46 | | 6.65 | mg/L | | 104 | (90%-110%) | | |
| Fluoride | 2.50 | | 0.181 | | 2.70 | mg/L | | 101 | (90%-110%) | | |
| Sulfate | 10.0 | | 1.61 | | 12.0 | mg/L | | 103 | (90%-110%) | | |
| QC1203211476 361141005 PS | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.36 | mg/L | | 104 | (90%-110%) | | 11/16/14 21:20 |
| Chloride | 5.00 | | 6.92 | | 12.8 | mg/L | | 118* | (90%-110%) | | |
| Fluoride | 2.50 | | 0.291 | | 2.81 | mg/L | | 101 | (90%-110%) | | |
| Sulfate | 10.0 | | 5.70 | | 16.4 | mg/L | | 107 | (90%-110%) | | |

**Nutrient Analysis**

## QC Summary

**Workorder:** **360220**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1432165 | | | | | | | | | | | |
| QC1203201187 360220007 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | | 0.127 | | 0.0677 | mg/L | 60.9*^ | | (+/-0.050) | KLP1 | 11/11/14 15:51 |
| QC1203199678 LCS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 1.02 | mg/L | | 102 | (90%-110%) | | 11/11/14 15:33 |
| QC1203199677 MB | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | U | ND | mg/L | | | | | 11/11/14 15:32 |
| QC1203201188 360220007 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | 0.127 | | 1.08 | mg/L | | 95.3 | (90%-110%) | | 11/11/14 15:56 |
| Batch 1432167 | | | | | | | | | | | |
| QC1203199685 360117010 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | 0.153 | | 0.161 | mg/L | 5.10 ^ | | (+/-0.100) | KLP1 | 11/05/14 12:56 |
| QC1203199684 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 0.953 | mg/L | | 95.3 | (90%-110%) | | 11/05/14 12:38 |
| QC1203199683 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | U | ND | mg/L | | | | | 11/05/14 12:37 |
| QC1203199686 360117010 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | 0.153 | | 1.25 | mg/L | | 110 | (90%-110%) | | 11/05/14 13:15 |
| Batch 1432171 | | | | | | | | | | | |
| QC1203199699 360117011 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | U | ND | U | ND | mg/L | N/A | | | KLP1 | 11/05/14 10:55 |
| QC1203199696 LCS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 1.04 | mg/L | | 104 | (83%-123%) | | 11/05/14 10:46 |
| QC1203199695 MB | | | | | | | | | | | |
| Phosphorus, Total as P | | | | U | ND | mg/L | | | | | 11/05/14 10:42 |
| QC1203199700 360117011 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | U | ND | | 0.990 | mg/L | | 99 | (59%-141%) | | 11/05/14 10:56 |
| Batch 1432964 | | | | | | | | | | | |
| QC1203201561 360298001 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | U | ND | U | ND | mg/L | N/A | | | AXH3 | 11/05/14 09:41 |
| QC1203201559 LCS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 0.977 | mg/L | | 97.7 | (90%-110%) | | 11/04/14 15:45 |
| QC1203201558 MB | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | | U | ND | mg/L | | | | | 11/04/14 15:44 |

## QC Summary

**Workorder:** **360220**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1432964 | | | | | | | | | | | |
| QC1203201563 360298001 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | U | ND | | 0.979 | mg/L | | 97.9 | (90%-110%) | AXH3 | 11/05/14 09:42 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1432682 | | | | | | | | | | | |
| QC1203200888 360220007 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 113 | | 137 | mg/L | 19.4* | | (0%-10%) | MXB3 | 11/03/14 10:37 |
| QC1203200889 360285007 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 123 | | 126 | mg/L | 2.30 | | (0%-10%) | | 11/03/14 10:37 |
| QC1203200887 LCS | | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | | 291 | mg/L | | 97.1 | (95%-105%) | | 11/03/14 10:37 |
| QC1203200886 MB | | | | | | | | | | | |
| Total Dissolved Solids | | | | U | ND | mg/L | | | | | 11/03/14 10:37 |
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1433707 | | | | | | | | | | | |
| QC1203203373 360285007 DUP | | | | | | | | | | | |
| Conductivity | | | 194 | | 192 | umhos/cm | 0.904 | | (0%-10%) | PXO1 | 11/05/14 13:38 |
| QC1203203374 360288001 DUP | | | | | | | | | | | |
| Conductivity | | | 374 | | 376 | umhos/cm | 0.528 | | (0%-10%) | | 11/05/14 13:42 |
| QC1203203372 LCS | | | | | | | | | | | |
| Conductivity | 1410 | | | | 1420 | umhos/cm | | 100 | (95%-105%) | | 11/05/14 13:18 |
| Batch 1433708 | | | | | | | | | | | |
| QC1203203394 360288001 DUP | | | | | | | | | | | |
| pH | | H | 7.70 | H | 7.72 | SU | 0.264 | | (0%-5%) | PXO1 | 11/05/14 14:36 |
| QC1203203395 360285007 DUP | | | | | | | | | | | |
| pH | | H | 8.05 | H | 8.07 | SU | 0.267 | | (0%-5%) | | 11/05/14 14:26 |
| QC1203203393 LCS | | | | | | | | | | | |
| pH | 7.00 | | | | 7.04 | SU | | 101 | (99%-101%) | | 11/05/14 13:52 |
| Batch 1435239 | | | | | | | | | | | |
| QC1203207410 360285007 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | 79.7 | | 78.7 | mg/L | 1.31 | | (0%-20%) | PXO1 | 11/12/14 17:57 |
| Carbonate alkalinity (CaCO3) | | U | ND | U | ND | mg/L | N/A | | | | |
| QC1203207407 LCS | | | | | | | | | | | |

## QC Summary

**Workorder:** **360220**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1435239 | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | 52.3 | mg/L | | 105 | (90%-110%) | | 11/12/14 | 17:25 |
| QC1203207405 MB | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | U | ND | mg/L | | | | PXO1 | 11/12/14 | 17:25 |
| Carbonate alkalinity (CaCO3) | | | U | ND | mg/L | | | | | | |
| QC1203207413 360285007 MS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | 79.7 | | 130 | mg/L | | 101 | (80%-120%) | | 11/12/14 | 17:59 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

## QC Summary

**Workorder:** **360220**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 05-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| BALANCE | EPA 160.1, SM 2540C | Liquid | ESHL, PPLS, UCOR |
| **Batch ID:** | **Sample Numbers:** | | |
| 1432682 | See Below | | |

**Potentially affected work order(s)(SDG): 360151,360220(2015-187),360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189)**

**Application Issues:**

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203200888DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Morgan Buckner 05-NOV-14

**Data Validator/Group Leader:**

Elzbieta Szulc 12-NOV-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 06-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** LACHAT Flow Injection Analyzer | **Test / Method:** EPA 335.4, EPA 335.4 SC, SW846 9012B | **Matrix Type:** Liquid | **Client Code:** ESHL |
| **Batch ID:** 1432348 | **Sample Numbers:** See Below | | |

**Potentially affected work order(s)(SDG):** **360117(2015-172),360121(2015-170),360220(2015-187),360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189),360424(2015-204),360425(2015-207),360431(2015-208)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203200103MS | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference. |

**Originator's Name:**
Aubrey Kingsbury 06-NOV-14

**Data Validator/Group Leader:**
Kristen Parson 06-NOV-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 11-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** PC-Titrate TitraSip System | **Test / Method:** EPA 150.1, SW846 9040B/9040C, SW846 9040C | **Matrix Type:** Liquid | **Client Code:** ESHL, NEXT, PAES, URSC |
| **Batch ID:** 1433708 | **Sample Numbers:** See Below | | |

**Potentially affected work order(s)(SDG):** **360053(2015-163),360117(2015-172),360121(2015-170),360220(2015-187),360243,360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189),360402,360424(2015-204),360425(2015-207),360431(2015-208),360498**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Sample received out of holding:<br>360053 007<br>360117 011<br>360121 007<br>360220 007<br>360243 001<br>360285 007<br>360288 001,002<br>360294 001,002<br>360298 001,002<br>360402 001<br>360424 007<br>360425 013,016<br>360431 007,019,028<br>360498 003 | 1. Samples were received and analyzed outside of method specified holding time. |

**Originator's Name:**
Patrick Orgel 11-NOV-14

**Data Validator/Group Leader:**
Elzbieta Szulc 14-NOV-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 12-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 350.1, EPA 350.1 SC | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1432165 | See Below | | |

**Potentially affected work order(s)(SDG): 360220(2015-187),360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189)**

**Application Issues:**

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203201187DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 12-NOV-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 12-NOV-14

# Radiological Analysis

**Radiochemistry Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-187**
**Work Order 360220**

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Am241 Liquid** |
| Analytical Method: | DOE EML HASL-300, Am-05-RC Modified |
| Analytical Batch Number: | 1432557 |

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203200601 | MB for batch 1432557 |
| 1203200603 | Laboratory Control Sample (LCS) |
| 1203200602 | 360121003(CAMO-14-87137) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in October 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203200601 (MB) and 1203200603 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360121003 (CAMO-14-87137). The QC was from ARSL work order 360121.

**QC Information**
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

**CSU**
The Am-241 blank result is greater than 1.65 times the CSU but less than the MDC.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1357445 was generated due to RDL less than MDA and Failed Yield for Surrogates. 1. Samples 360053003, 360057004, 360121003, 360220006, and 1203200602 did not meet the detection limits for Am-241 due to the high standard deviation. 2. The Duplicate sample 1203200602 does not meet the client tracer yield requirement of 50 to 105 percent. 1. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Reporting results. 2. The sample does meet the GEL standard tracer yield requirements of 15 to 125 percent and over 400 tracer counts were achieved. In addition, the QC sample 360121003 did meet the client tracer yield recovery requirements and there is no reportable activity in either of the samples. Reporting results.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Pu, Liquid** |
| Analytical Method: | DOE EML HASL-300, Pu-11-RC Modified |

Analytical Batch Number: 1432558

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203200604 | MB for batch 1432558 |
| 1203200606 | Laboratory Control Sample (LCS) |
| 1203200605 | 360121003(CAMO-14-87137) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibrations were performed in November 2014 and October 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203200604 (MB) and 1203200606 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360121003 (CAMO-14-87137). The QC was from ARSL work order 360121.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
The batch was recounted due to analyst error. The recounts are reported for samples 1203200604 and 1203200606. Samples 1203200605 (CAMO-14-87137DUP) and 360220006 (CAWR-14-89231) were recounted again due to high MDAs and the third counts are reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Iso U** |
| Analytical Method: | DOE EML HASL-300, U-02-RC Modified |
| Analytical Batch Number: | 1432560 |

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203200610 | MB for batch 1432560 |
| 1203200612 | Laboratory Control Sample (LCS) |
| 1203200611 | 360121003(CAMO-14-87137) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in November 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203200610 (MB) and 1203200612 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360121003 (CAMO-14-87137). The QC was from ARSL work order 360121.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population. Sample 1203200612 (LCS) did not meet the client's yield requirement. However, there are 400 tracer counts, GEL's standard tracer yield requirements are met, and the client's detection limits are met.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Gammaspec** |
| Analytical Method: | EPA 901.1 |
| Analytical Batch Number: | 1432024 |

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203199356 | MB for batch 1432024 |
| 1203199358 | Laboratory Control Sample (LCS) |
| 1203199357 | 360121003(CAMO-14-87137) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2014, June 2014, October 2014 and September 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
The blank volume is representative of the sample volume in this batch.

**Designated QC**
The following sample was used for QC: 360121003 (CAMO-14-87137). The QC was from ARSL work order 360121.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
Additional comments were not required for this sample set.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **WSP-GrossA/B** |
| Analytical Method: | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1433352 |

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203202542 | MB for batch 1433352 |
| 1203202546 | Laboratory Control Sample (LCS) |
| 1203202543 | 360431003(CAPA-14-87204) Sample Duplicate (DUP) |
| 1203202544 | 360431003(CAPA-14-87204) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203202542 (MB) and 1203202546 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360431003 (CAPA-14-87204). The QC was from ARSL work order 360431.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Gross Alpha/Beta Preparation Information**
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for

alpha activity.

**Recounts**
Sample 1203202546 (LCS) was recounted due to high recovery. The recount is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike and matrix spike duplicate, 1203202544 (CAPA-14-87204MS) and 1203202545 (CAPA-14-87204MSD), aliquots were reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **GFPC, Sr90, liquid** |
| Analytical Method: | EPA 905.0 Modified |
| Analytical Batch Number: | 1434929 |

| Sample ID | Client ID |
|---|---|
| 360220006 | CAWR-14-89231 |
| 1203206647 | MB for batch 1434929 |
| 1203206650 | Laboratory Control Sample (LCS) |
| 1203206648 | 360053003(CAPA-14-87194) Sample Duplicate (DUP) |
| 1203206649 | 360053003(CAPA-14-87194) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in March 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203206647 (MB) and 1203206650 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360053003 (CAPA-14-87194). The QC was from ARSL work order 360053.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**
Sample 1203206647 (MB) was recounted due to a suspected blank false positive. The recount is reported.
Sample 1203206648 (CAPA-14-87194DUP) was recounted due to a suspected false positive. The recount is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike, 1203206649 (CAPA-14-87194MS), aliquot was reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-187  GEL Work Order: 360220

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** **Name: Kate Gellatly**

**Date: 26 NOV 2014**  **Title: Analyst I**

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 20-NOV-14 | Radiochemistry | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ALPHA SPECTROMETER | DOE EML HASL-300, Am-05-RC Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1432557 | See Below | | |

**Potentially affected work order(s)(SDG):** **359935(2015-149),359943(2015-150),360053(2015-163),360057(2015-162),360121(2015-170),360220(2015-187)**

**Application Issues:**

RDL less than MDA

Failed Yield for Surrogates

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Samples 360053003, 360057004, 360121003, 360220006, and 1203200602 did not meet the detection limits for Am-241 due to the high standard deviation. | 1. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Reporting results. |
| 2. The Duplicate sample 1203200602 does not meet the client tracer yield requirement of 50 to 105 percent. | 2. The sample does meet the GEL standard tracer yield requirements of 15 to 125 percent and over 400 tracer counts were achieved. In addition, the QC sample 360121003 did meet the client tracer yield recovery requirements and there is no reportable activity in either of the samples. Reporting results. |

**Originator's Name:**

Jessica Downey 20-NOV-14

**Data Validator/Group Leader:**

Jessica Davis 20-NOV-14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: November 26, 2014

Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client Sample ID: CAWR-14-89231
Sample ID: 360220006
Matrix: W
Collect Date: 29-OCT-14
Receive Date: 31-OCT-14
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.00 | +/-0.00533 | 0.0557 | 0.0242 | +/-0.00533 | 0.050 | pCi/L | | JXD2 | 11/19/14 | 1116 | 1432557 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | -0.00625 | +/-0.00644 | 0.0311 | 0.0126 | +/-0.00644 | 0.050 | pCi/L | | JXD2 | 11/19/14 | 1407 | 1432558 | 2 |
| Plutonium-239/240 | U | 0.011 | +/-0.00609 | 0.0461 | 0.0201 | +/-0.00611 | 0.050 | pCi/L | | | | | | |
| *Iso U "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 2.01 | +/-0.0843 | 0.0719 | 0.0312 | +/-0.159 | 1.00 | pCi/L | | JXD2 | 11/17/14 | 1432 | 1432560 | 3 |
| Uranium-235/236 | | 0.0651 | +/-0.0189 | 0.0626 | 0.0254 | +/-0.0194 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 1.15 | +/-0.0639 | 0.0689 | 0.0297 | +/-0.100 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | 0.780 | +/-1.96 | 6.47 | 2.91 | +/-1.97 | 8.00 | pCi/L | | MJH1 | 11/04/14 | 1119 | 1432024 | 4 |
| Cobalt-60 | U | 0.0359 | +/-1.97 | 6.48 | 2.75 | +/-1.97 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | -3.16 | +/-3.77 | 12.7 | 5.94 | +/-3.84 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | 7.70 | +/-18.8 | 72.8 | 31.5 | +/-18.8 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | 1.43 | +/-1.58 | 6.63 | 2.84 | +/-1.62 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | -0.183 | +/-0.127 | 0.495 | 0.226 | +/-0.127 | 0.500 | pCi/L | | KSD1 | 11/22/14 | 1303 | 1434929 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | | 5.72 | +/-0.612 | 1.81 | 0.884 | +/-0.784 | 3.00 | pCi/L | | JXH3 | 11/18/14 | 2241 | 1433352 | 6 |
| Alpha | | 3.25 | +/-0.627 | 1.77 | 0.815 | +/-0.685 | 3.00 | pCi/L | | JXH3 | 11/19/14 | 2019 | 1433352 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1432557 | 83.4 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1432558 | 60.9 | (50%-105%) |
| Uranium-232 Tracer | Iso U "As Received" | 1432560 | 62.1 | (50%-105%) |

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: November 26, 2014

Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client Sample ID: CAWR-14-89231
Sample ID: 360220006

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1434929 | 91.5 | (50%-105%) |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# Quality Control Data

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

**Report Date: November 26, 2014**


**Client :** **Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**

**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **360220**

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1432557 | | | | | | | | | | |
| QC1203200602 360121003 DUP | | | | | | | | | | |
| Americium-241 | U | 0.0144 | U | 0.0134 | pCi/L | 0.0256 | | (0-1) | JXD2 | 11/19/1411:16 |
| | Uncert: | +/-0.00764 | | +/-0.0119 | | | | | | |
| | TPU: | +/-0.00767 | | +/-0.0119 | | | | | | |
| **Americium-243 Tracer | 2.67 | 2.04 | | 1.31 | pCi/L | | 49.1 * | (50%-105%) | | |
| | Uncert: | +/-0.0876 | | +/-0.109 | | | | | | |
| | TPU: | +/-0.147 | | +/-0.173 | | | | | | |
| QC1203200603 LCS | | | | | | | | | | |
| Americium-241 | 1.41 | | | 1.29 | pCi/L | | 91.4 | (80%-120%) | JXD2 | 11/19/1411:16 |
| | Uncert: | | | +/-0.0489 | | | | | | |
| | TPU: | | | +/-0.0724 | | | | | | |
| **Americium-243 Tracer | 2.14 | | | 2.06 | pCi/L | | 96.3 | (50%-105%) | | |
| | Uncert: | | | +/-0.0625 | | | | | | |
| | TPU: | | | +/-0.108 | | | | | | |
| QC1203200601 MB | | | | | | | | | | |
| Americium-241 | | | U | 0.0111 | pCi/L | | | | JXD2 | 11/19/1411:16 |
| | Uncert: | | | +/-0.00522 | | | | | | |
| | TPU: | | | +/-0.00524 | | | | | | |
| **Americium-243 Tracer | 2.14 | | | 2.02 | pCi/L | | 94.5 | (50%-105%) | | |
| | Uncert: | | | +/-0.0626 | | | | | | |
| | TPU: | | | +/-0.109 | | | | | | |
| Batch 1432558 | | | | | | | | | | |
| QC1203200605 360121003 DUP | | | | | | | | | | |
| Plutonium-238 | U | 0.00955 | U | -0.00638 | pCi/L | 0.470 | | (0-1) | JXD2 | 11/19/1414:07 |
| | Uncert: | +/-0.00993 | | +/-0.007 | | | | | | |
| | TPU: | +/-0.00994 | | +/-0.007 | | | | | | |
| Plutonium-239/240 | U | 0.00762 | U | 0.00597 | pCi/L | 0.0524 | | (0-1) | | |
| | Uncert: | +/-0.0086 | | +/-0.00718 | | | | | | |
| | TPU: | +/-0.0086 | | +/-0.00718 | | | | | | |
| **Plutonium-242 Tracer | 2.46 | 1.09 | | 1.62 | pCi/L | | 65.8 | (50%-105%) | | |
| | Uncert: | +/-0.069 | | +/-0.0688 | | | | | | |
| | TPU: | +/-0.119 | | +/-0.119 | | | | | | |
| QC1203200606 LCS | | | | | | | | | | |
| Plutonium-238 | | | U | 0.0116 | pCi/L | | | (80%-120%) | JXD2 | 11/18/1411:42 |
| | Uncert: | | | +/-0.00897 | | | | | | |
| | TPU: | | | +/-0.00898 | | | | | | |
| Plutonium-239/240 | 1.97 | | | 2.03 | pCi/L | | 103 | (80%-120%) | | |
| | Uncert: | | | +/-0.0689 | | | | | | |
| | TPU: | | | +/-0.114 | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.50 | pCi/L | | 76.4 | (50%-105%) | | |
| | Uncert: | | | +/-0.0676 | | | | | | |
| | TPU: | | | +/-0.110 | | | | | | |

## QC Summary

**Workorder: 360220**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1432558 | | | | | | | | | | |
| QC1203200604 MB | | | | | | | | | | |
| Plutonium-238 | | | U | 0.00 | pCi/L | | | | JXD2 | 11/18/1412:54 |
| | Uncert: | | | +/-0.0031 | | | | | | |
| | TPU: | | | +/-0.0031 | | | | | | |
| Plutonium-239/240 | | | U | 0.00 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00536 | | | | | | |
| | TPU: | | | +/-0.00536 | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.59 | pCi/L | | 80.7 | (50%-105%) | | |
| | Uncert: | | | +/-0.066 | | | | | | |
| | TPU: | | | +/-0.109 | | | | | | |
| Batch 1432560 | | | | | | | | | | |
| QC1203200611 360121003 DUP | | | | | | | | | | |
| Uranium-234 | | 0.223 | | 0.245 | pCi/L | 0.174 | | (0-1) | JXD2 | 11/17/1414:32 |
| | Uncert: | +/-0.0273 | | +/-0.0267 | | | | | | |
| | TPU: | +/-0.031 | | +/-0.0311 | | | | | | |
| Uranium-235/236 | U | 0.0112 | U | 0.00332 | pCi/L | 0.198 | | (0-1) | | |
| | Uncert: | +/-0.00986 | | +/-0.00997 | | | | | | |
| | TPU: | +/-0.00989 | | +/-0.00997 | | | | | | |
| Uranium-238 | | 0.106 | | 0.121 | pCi/L | 0.189 | | (0-1) | | |
| | Uncert: | +/-0.0188 | | +/-0.0192 | | | | | | |
| | TPU: | +/-0.0201 | | +/-0.0207 | | | | | | |
| **Uranium-232 Tracer | 2.73 | 1.73 | | 2.19 | pCi/L | | 80.2 | (50%-105%) | | |
| | Uncert: | +/-0.0921 | | +/-0.0862 | | | | | | |
| | TPU: | +/-0.202 | | +/-0.197 | | | | | | |
| QC1203200612 LCS | | | | | | | | | | |
| Uranium-234 | | | | 2.99 | pCi/L | | | | JXD2 | 11/17/1414:32 |
| | Uncert: | | | +/-0.106 | | | | | | |
| | TPU: | | | +/-0.236 | | | | | | |
| Uranium-235/236 | | | | 0.130 | pCi/L | | | | | |
| | Uncert: | | | +/-0.0263 | | | | | | |
| | TPU: | | | +/-0.0279 | | | | | | |
| Uranium-238 | 2.72 | | | 2.99 | pCi/L | | 110 | (80%-120%) | | |
| | Uncert: | | | +/-0.107 | | | | | | |
| | TPU: | | | +/-0.236 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.01 | pCi/L | | 46.2 * | (50%-105%) | | |
| | Uncert: | | | +/-0.0918 | | | | | | |
| | TPU: | | | +/-0.179 | | | | | | |
| QC1203200610 MB | | | | | | | | | | |
| Uranium-234 | | | U | -0.00332 | pCi/L | | | | JXD2 | 11/17/1414:32 |
| | Uncert: | | | +/-0.0129 | | | | | | |
| | TPU: | | | +/-0.0129 | | | | | | |
| Uranium-235/236 | | | U | 0.0041 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00918 | | | | | | |
| | TPU: | | | +/-0.00918 | | | | | | |
| Uranium-238 | | | U | 0.00332 | pCi/L | | | | | |
| | Uncert: | | | +/-0.012 | | | | | | |
| | TPU: | | | +/-0.012 | | | | | | |

## QC Summary

**Workorder:** **360220**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1432560 | | | | | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.13 | pCi/L | | 51.6 | (50%-105%) | | |
| | Uncert: | | | +/-0.0855 | | | | | | |
| | TPU: | | | +/-0.173 | | | | | | |
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1432024 | | | | | | | | | | |
| QC1203199357 360121003 DUP | | | | | | | | | | |
| Cesium-137 | U | -0.548 | U | -0.252 | pCi/L | 0.040 | | (0-1) | MJH1 | 11/05/1406:43 |
| | Uncert: | +/-1.85 | | +/-1.85 | | | | | | |
| | TPU: | +/-1.85 | | +/-1.85 | | | | | | |
| Cobalt-60 | U | 0.748 | U | 0.396 | pCi/L | 0.0537 | | (0-1) | | |
| | Uncert: | +/-1.54 | | +/-1.73 | | | | | | |
| | TPU: | +/-1.55 | | +/-1.74 | | | | | | |
| Neptunium-237 | U | 1.69 | U | -3.44 | pCi/L | 0.379 | | (0-1) | | |
| | Uncert: | +/-3.26 | | +/-3.39 | | | | | | |
| | TPU: | +/-3.28 | | +/-3.48 | | | | | | |
| Potassium-40 | U | 5.24 | U | 4.39 | pCi/L | 0.0105 | | (0-1) | | |
| | Uncert: | +/-17.5 | | +/-22.6 | | | | | | |
| | TPU: | +/-17.6 | | +/-22.6 | | | | | | |
| Sodium-22 | U | -1.68 | U | 0.570 | pCi/L | 0.341 | | (0-1) | | |
| | Uncert: | +/-1.56 | | +/-1.69 | | | | | | |
| | TPU: | +/-1.61 | | +/-1.69 | | | | | | |
| QC1203199358 LCS | | | | | | | | | | |
| Americium-241 | 34500 | | | 38200 | pCi/L | | 111 | (80%-120%) | MJH1 | 11/05/1406:44 |
| | Uncert: | | | +/-546 | | | | | | |
| | TPU: | | | +/-1440 | | | | | | |
| Cesium-137 | 13900 | | | 14600 | pCi/L | | 105 | (80%-120%) | | |
| | Uncert: | | | +/-164 | | | | | | |
| | TPU: | | | +/-625 | | | | | | |
| Cobalt-60 | 16800 | | | 16900 | pCi/L | | 101 | (80%-120%) | | |
| | Uncert: | | | +/-197 | | | | | | |
| | TPU: | | | +/-724 | | | | | | |
| Neptunium-237 | | | U | 86.0 | pCi/L | | | | | |
| | Uncert: | | | +/-70.2 | | | | | | |
| | TPU: | | | +/-73.0 | | | | | | |
| Potassium-40 | | | U | 104 | pCi/L | | | | | |
| | Uncert: | | | +/-165 | | | | | | |
| | TPU: | | | +/-167 | | | | | | |
| Sodium-22 | | | U | 17.0 | pCi/L | | | | | |
| | Uncert: | | | +/-22.7 | | | | | | |
| | TPU: | | | +/-23.0 | | | | | | |
| QC1203199356 MB | | | | | | | | | | |
| Cesium-137 | | | U | -1.99 | pCi/L | | | | MJH1 | 11/04/1412:38 |
| | Uncert: | | | +/-1.38 | | | | | | |
| | TPU: | | | +/-1.46 | | | | | | |
| Cobalt-60 | | | U | -0.239 | pCi/L | | | | | |
| | Uncert: | | | +/-1.34 | | | | | | |

## QC Summary

**Workorder:** **360220**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1432024 | | | | | | | | | | |
| | TPU: | | | +/-1.34 | | | | | | |
| Neptunium-237 | | | U | 4.28 | pCi/L | | | | | |
| | Uncert: | | | +/-2.88 | | | | | | |
| | TPU: | | | +/-3.05 | | | | | | |
| Potassium-40 | | | U | -15.1 | pCi/L | | | | | |
| | Uncert: | | | +/-17.8 | | | | | | |
| | TPU: | | | +/-18.2 | | | | | | |
| Sodium-22 | | | U | 1.33 | pCi/L | | | | | |
| | Uncert: | | | +/-1.47 | | | | | | |
| | TPU: | | | +/-1.50 | | | | | | |
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1433352 | | | | | | | | | | |
| QC1203202543 360431003 DUP | | | | | | | | | | |
| Alpha | U | 0.255 | U | 0.227 | pCi/L | 0.0144 | | (0-1) | JXH3 | 11/19/1420:07 |
| | Uncert: | +/-0.604 | | +/-0.381 | | | | | | |
| | TPU: | +/-0.604 | | +/-0.382 | | | | | | |
| Beta | U | 1.96 | U | 0.612 | pCi/L | 0.629 | | (0-1) | | 11/18/1421:01 |
| | Uncert: | +/-0.620 | | +/-0.425 | | | | | | |
| | TPU: | +/-0.641 | | +/-0.428 | | | | | | |
| QC1203202546 LCS | | | | | | | | | | |
| Alpha | 12.2 | | | 13.0 | pCi/L | | 107 | (80%-120%) | JXH3 | 11/19/1414:52 |
| | Uncert: | | | +/-0.660 | | | | | | |
| | TPU: | | | +/-1.27 | | | | | | |
| Beta | 47.7 | | | 50.8 | pCi/L | | 107 | (80%-120%) | | 11/19/1408:46 |
| | Uncert: | | | +/-0.935 | | | | | | |
| | TPU: | | | +/-4.39 | | | | | | |
| QC1203202542 MB | | | | | | | | | | |
| Alpha | | | U | 0.0592 | pCi/L | | | | JXH3 | 11/19/1414:59 |
| | Uncert: | | | +/-0.0938 | | | | | | |
| | TPU: | | | +/-0.094 | | | | | | |
| Beta | | | U | 0.0391 | pCi/L | | | | | 11/18/1418:37 |
| | Uncert: | | | +/-0.112 | | | | | | |
| | TPU: | | | +/-0.112 | | | | | | |
| QC1203202544 360431003 MS | | | | | | | | | | |
| Alpha | 243 U | 0.255 | | 288 | pCi/L | | 118 | (75%-125%) | JXH3 | 11/19/1414:52 |
| | Uncert: | +/-0.604 | | +/-14.3 | | | | | | |
| | TPU: | +/-0.604 | | +/-28.2 | | | | | | |
| Beta | 954 U | 1.96 | | 1130 | pCi/L | | 118 | (75%-125%) | | 11/18/1418:23 |
| | Uncert: | +/-0.620 | | +/-19.6 | | | | | | |
| | TPU: | +/-0.641 | | +/-96.9 | | | | | | |
| QC1203202545 360431003 MSD | | | | | | | | | | |
| Alpha | 243 U | 0.255 | | 275 | pCi/L | 0.115 | 113 | (0-1) | JXH3 | 11/19/1414:52 |
| | Uncert: | +/-0.604 | | +/-13.9 | | | | | | |
| | TPU: | +/-0.604 | | +/-27.1 | | | | | | |
| Beta | 954 U | 1.96 | | 1170 | pCi/L | 0.0985 | 123 | (0-1) | | 11/18/1418:23 |
| | Uncert: | +/-0.620 | | +/-20.5 | | | | | | |

## QC Summary

**Workorder:** **360220**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1433352 | | | | | | | | | | |
| | TPU: | +/-0.641 | | +/-103 | | | | | | |
| Batch 1434929 | | | | | | | | | | |
| QC1203206648 360053003 DUP | | | | | | | | | | |
| Strontium-90 | U | -0.163 | U | 0.100 | pCi/L | 0.479 | | (0-1) | KSD1 | 11/23/1414:28 |
| | Uncert: | +/-0.126 | | +/-0.148 | | | | | | |
| | TPU: | +/-0.126 | | +/-0.148 | | | | | | |
| **Strontium Carrier | 7.65 | 6.80 | | 6.30 | mg | | 82.4 | (50%-105%) | | |
| QC1203206650 LCS | | | | | | | | | | |
| Strontium-90 | 23.9 | | | 23.4 | pCi/L | | 98 | (80%-120%) | KSD1 | 11/22/1413:26 |
| | Uncert: | | | +/-0.638 | | | | | | |
| | TPU: | | | +/-1.97 | | | | | | |
| **Strontium Carrier | 7.65 | | | 7.00 | mg | | 91.5 | (50%-105%) | | |
| QC1203206647 MB | | | | | | | | | | |
| Strontium-90 | | | U | 0.153 | pCi/L | | | | KSD1 | 11/23/1414:27 |
| | Uncert: | | | +/-0.137 | | | | | | |
| | TPU: | | | +/-0.138 | | | | | | |
| **Strontium Carrier | 7.65 | | | 6.80 | mg | | 88.9 | (50%-105%) | | |
| QC1203206649 360053003 MS | | | | | | | | | | |
| Strontium-90 | 239 U | -0.163 | | 237 | pCi/L | | 99.1 | (75%-125%) | KSD1 | 11/22/1413:26 |
| | Uncert: | +/-0.126 | | +/-6.20 | | | | | | |
| | TPU: | +/-0.126 | | +/-20.1 | | | | | | |
| **Strontium Carrier | 7.65 | 6.80 | | 7.20 | mg | | 94.1 | (50%-105%) | | |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

| | |
|---|---|
| ** | Analyte is a Tracer compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| BD | Results are either below the MDC or tracer recovery is low |
| FA | Failed analysis. |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| K | Analyte present. Reported value may be biased high. Actual value is expected to be lower. |
| L | Analyte present. Reported value may be biased low. Actual value is expected to be higher. |
| M | M if above MDC and less than LLD |
| M | REMP Result > MDC/CL and < RDL |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Sample results are rejected |

# QC Summary

**Workorder:** **360220**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| UI | Gamma Spectroscopy--Uncertain identification |
| UJ | Gamma Spectroscopy--Uncertain identification |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | Other specific qualifiers were required to properly define the results. Consult case narrative. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
** Indicates analyte is a surrogate/tracer compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

American Radiation Services - Primary

1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEP

**COC/Lab Request #:** 2015-197



**Client Contact:**

**Lab Agreement # :** 63641-001-10

**Project Number :**

**Analysis Turnaround Time:**

- 24 Hour - ☐
- Other - ☐
- 7 Day - ☐
- 14 Day - ☐
- 21 Day - ☐
- 28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-89231 | Oct 29 2014 | 10:00 | W | 1 |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Williams-Mark | 10/30/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89231

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 10/29/2014 | **FIELD MATRIX:** | WG | ok |
| **TIME COLLECTED (HH:MM):** | | 1000 | **MEDIA:** | UA | ↓ |
| **PRS ID:** | | ok | **SAMPLE TECH CODE:** | UA | PP |
| **LOCATION ID:** | Spring 2 | | **FIELD PREP:** | UF | ok |
| **LOCATION TYPE:** | SPR | | **FIELD QC TYPE:** | REG | ↓ |
| **PORT:** | | ↓ | **SAMPLE USAGE:** | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| ↓ | WSP-8082-PCB | 1 LITER AMBER GLASS 10PH 2 | 3 | ICE | ↓ | ↓ |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| ↓ | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS 2 | 3 | ICE | ↓ | ↓ |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | ↓ | ↓ |
| ↓ | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | ↓ | ↓ |
| ↓ | WSP-RAD | 1 GAL POLY | 1 | HNO3 | ↓ | ↓ |
| ↓ | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

| | | | |
|---|---|---|---|
| **EVENT ID:** | 6955 | **EVENT NAME:** | White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions |
| **SAMPLE ID:** | CAWR-14-89231 | **WORK ORDER:** | NA |

**SAMPLE COMMENTS:** possibly small invertebrates in sample b/c seen in pool, also some organics (leaf matter) in samples

**LOCATION COMMENTS:** NA

**FIELD PARAMETERS:**

Dissolved Oxygen 8.35 mg/L Flow (in gpm) 0.4 GPM Oxidation-Reduction Potential NA mV

pH 7.53 SU Specific Conductance 238 uS/cm Temperature 12.65 deg C

Turbidity 27.7 NTU

**COLLECTED BY (PRINT)** S. Bergh-ll

| | | | |
|---|---|---|---|
| **RELINQUISHED BY (Printed Name) (Signature)** Andrew Stocker | **Date/Time** 10/29/14 1415 | **RECEIVED BY (Printed Name) (Signature)** K. Greene | **Date/Time** 10/29/14 2115 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 10/08/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-197

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| ARS1-14-02999 | Generic:Low_Level_Tritium | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-14-02999 | Generic:Low_Level_Tritium | ARS1-B14- | ARS1-B14- | 1 | | | | | 1 | | | | | 1 | 1 | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| Generic:Low_Level_Tritium | RAD | CAWR-14-89231 | ARS1-B14-03174-13 | REG | 1 | 0 | 0 | 0 |
| Generic:Low_Level_Tritium | RAD | LCS | ARS1-B14-03174-01 | LCS | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | LCSD | ARS1-B14-03174-02 | LCSD | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | MB | ARS1-B14-03174-03 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

# DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2 | 2015-197 | CAWR-14-89231 | REG | INIT | RAD | Generic:Low_Level_Tritiu | Tritium | U | U | R5 | N | -0.9400 | pCi/L | -0.9400 | pCi/L | 2.7500 | 0.7990 | W | 10/29/2014 | | ARS1-B14-03174 | VAL | Y |

**Reason Code** **Description**

# DATA VALIDATION REPORT

| Reason Code | Description |
|---|---|
| R5 | Analyte is not detected because the amount reported is less than the MDC. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-89231 | Spring 2 | REG | Generic:Low_Level_Tritium | 0 | 1 |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Request Number: 2015-197

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory Request: 2015-197

# Original COC

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEP

**COC/Lab Request #:** 2015-197



**Client Contact:**

**Lab Agreement # :** 63641-001-10

**Project Number :**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-89231 | Oct 29 2014 | 10:00 | W | 1 |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| [signature] | Melissa Martinez | 10/30/14 3:00 | [signature] | Lynn Newman | 11-3-14 0810 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory Request: 2015-197

# Case Narrative

ARS INTERNATIONAL

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January 5, 2015

LANL
Keith Greene
PO Box 1663 MS M992
Los Alamos, NM 87545

Request Number: **2015-197**
LANL Sample ID: **CAWR-14-89231**

Dear Mr. Greene;

On November 3, 2014, ARS International received one (1) water sample to be analyzed for Low Level Tritium.

Sample was counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The client and QA/QC samples were counted with a count time sufficient to meet quality control parameters for counting equipment and were within acceptance criteria and statistical sound detection limits.

If you have any questions please do not hesitate to call at 225.381.2991 or email LANL@amrad.com.

Sincerely,

James D. Pu

Laboratory Management
**ARS International**

ARS INTERNATIONAL

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# COVER PAGE

## PROJECT SAMPLE IDENTIFICATION CROSS-REFERENCE TO ARS SAMPLE LABORATORY IDs

Subcontract (LANL Agreement Number) 250953

| Request Number | LANL PROJECT SAMPLE ID NUMBER | American Radiation Services SAMPLE ID NUMBER(S) |
|---|---|---|
| 2015-197 | CAWR-14-89231 | ARS1-14-02999-001 |

**SAMPLE RECEIPT**

The samples were received in good condition. The samples were screened for radioactive contamination as per procedure **ARS-062 "Sample Receiving"**. A 28-day turnaround was requested on the chain of custody.

**ANALYTICAL METHODS**

Tritium analyses were performed using **ARS-040, "Tritium Assay in Water Samples Using Electrolytic Enrichment".**

**ANALYTICAL RESULTS**

The result data that are flagged with "U" indicate that the activity is below the MDC.

**American Radiation Services Project Manager/Laboratory Director's Comments:**

*"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."*

*"I certify that this electronic image and all hardcopies produced from this image accurately represent the data and are in compliance with the LANL specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."*

| James D. Lum | Laboratory Management, ARS International | 01-06-15 |
|---|---|---|
| **Signature** | **Title** | **Date** |

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# ARS International, LLC

## Laboratory Analysis Report

## ARS1-14-02999

*Prepared for:*

## Los Alamos National Laboratory

**Keith Greene**
**P.O. Box 1663**
**MS M992**
**Los Alamos, NM 87545**
**kgreene@lanl.gov**

**Phone: 505-665-9966**
**Fax: 505-665-9972**

Susan Reese
**Project Manager Review**

James D. Pu
**Management Review**

Notes: ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

**Contact Person: Questions regarding this analytical report should be addressed to:**

**Project Manager**

**ProjectManagers@amrad.com**

**Phone: 225.381.2991**
**Fax: 225.381.2996**

ACLASS ACCREDITED DoD ELAP

**LELAP Cert# 01949**

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# Notes:

## Comments:

1.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.

2.0) Data in this report are within the limits of uncertainty specified in the reference method unless otherwise specified.

3.0) Modified analysis procedures are procedures that are modified to meet the certain specifications. An example may be the use of a water method to analyze a solid matrix due to the lack of an officially recognized procedure for the analysis of the solid matrix. Modified analyses are indicated by the subsequent addition of "m" to the procedure number (i.e. 900.0M).

4.0) Derived Air Concentrations and Effluent Release Concentrations are obtained from 10 CFR 20 Appendix B.

5.0) **Total activity** is actually total gamma activity and is determined utilizing the prominent gamma emitters from the naturally occurring radioactive decay chains and other prominent radioactive nuclides. Total activity may be lower than the actual total activity due to the extent of secular equilibrium achieved in the various decay chains at the time of analysis. The total activity is not representative of nuclides that emit solely alpha or beta particles.

6.0) Ra-228 is determined via secular equilibrium with its daughter, Actinium 228 (Gamma Spectroscopy only).

7.0) U-238 is determined via secular equilibrium with its daughter, Thorium 234 (Gamma Spectroscopy only).

8.0) All gamma spectroscopy was performed utilizing high purity germanium detectors (**HPGe**).

9.0) ARS makes every attempt to match sample density to calibrated density; however, in some cases, it is not practical or possible to do so and data results may be affected (Gamma Spectroscopy only).

10.0) Gamma spectroscopy results are calculated values based on the **ORTEC**® GammaVision ENV32 Analysis Engine.

11.0) ACLASS DOD and ISO 17025 certification applies only to the following analytes and methods: Gross Alpha and Gross Beta (EPA 900, SM7110B&C, SW846 9310); Radium 226 (EPA 903, EPA 903.1, SM 7500 Ra-B, SW846 9315); Radium 228 (EPA 904, SM 7500 Ra-B SW846 9320); Iodine-131(EPA 901.1); Uranium by ICPMS (EPA 200.8); Strontium 89/90 (EPA 905, Eichrom SRW01, HASL 300 Sr-03-RC); Tritium (EPA 906, EPA 906M); Gamma Emitters (EPA 901.1, SM7120B, HASL 300 Ga-01-R); Americium-241, Curium 242/244, Plutonium 239/240 and 241, Thorium 228/230/232, Uranium 234/233 and 238 (Eichrom ACW03 VBS); Lead 210 (HASL 300 Pb-01-RC, Eichrom OTW01); Polonium 210 (HASL 300 Po-01-RC, HASL 300 Po-02-RC); Technetium-99 (Eichrom TCW02, Eichrom TCS01M).

## Method References:

1.0) **EPA 600/4-80-032**; Prescribed Procedures for the Measurements of Radioactivity in Drinking Water, August 1980.

2.0) Standard Methods for Examination of Water and Waste Water, 18th, 1992.

3.0) **EPA SW-846**; Test Methods for Evaluating Solid Waste, Third Edition, (9/86). (Updated through 1995).

4.0) **EPA 600/4/79-020**; Methods for Chemical Analysis of Water and Waste, March 1983.

5.0) **HASL 300**

6.0) **ARS-040**; An LCSD is not reported with this process. The criteria for the LCS/LCSD analysis for reproducibility have not been established for Low Level Tritium analysis. A prepared standard for Low Level Tritium has not been developed. As a result, the standard we use is based on the dilution of a verified conventional tritium standard. The volume required for Low Level Tritium analysis, in addition to the lack of an available Low Level Tritium standard, introduce variability into the LCS/LCSD analysis that does not represent the actual sample analysis. The preferred measure for reproducibility is to run a duplicate analysis of a sample.

## Definitions:

| | | |
|---|---|---|
| 1.0) | **ND** | Not detected above the detection limit (non-detect). |
| 2.0) | **MDC** | (Minimum Detectable Concentration) minimum concentration of the analyte that ARS can detect utilizing the specific analysis |
| 3.0) | **MBL** | Method Blank |
| 4.0) | **DO** | Duplicate Original |
| 5.0) | **DUP** | Method Duplicate |
| 6.0) | **MS/MSD** | Matrix Spike/Matrix Spike Duplicate |
| 7.0) | **S** | Spike |
| 8.0) | **RS** | Reference Spike |
| 9.0) | ***SC** | Subcontracted out to another qualified laboratory |
| 10.0) | **NR** | Not Referenced |
| 11.0) | **N/A** | Not Applicable |
| 13.0) | **U** | Activity is below the MDC |
| 14.0) | **LCS/LCSD** | Laboratory Control Standard/Laboratory Control Standard Duplicate |
| 15.0) | **DLC** | Decision Level Concentration (ANSI N42.23) or critical level |

Notes: ARS International assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

***LELAP Cert# 01949*** ***NELAP Cert# E87558***

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS INTERNATIONAL

**ARS Sample Delivery Group:** ARS1-14-02999
**Client Sample ID:** CAWR-14-89231
**Sample Collection Date:** 10/29/14
**Sample Matrix:** Aqueous

**Request or PO Number:** 2015-197
**ARS Sample ID:** ARS1-14-02999-001
**Date Received:** 11/03/14
**Report Date:** 01/05/15

| Analysis Description | Analysis Results | CSU +/- 1 s | MDC | DLC | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|---|---|---|---|---|---|---|---|---|---|---|
| Enriched H-3 | -0.940 | 0.799 | 2.750 | 1.328 | U | pCi/L | ARS-040 | 12/31/14 23:24 | JPB | NA |

**NOTES:**

Project Manager Review

***Notes:*** *ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of ARS International, LLC. The results in this report pertain only to the samples tested and are intended solely for the use of the client.*

LELAP Certificate# 01949

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# QC Results Report

**Sample Delivery Group:** 14-02964; 65; 66; 99

## Laboratory Control Sample Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Percent Recovery (%) | LCS Acceptance Range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-03174 | LCS | H3 | 20.856 | 3.327 | 2.618 | 23.535 | | pCi/L | ARS-040 | 1/1/15 5:46 | JPB | 89 | 80%-120% |

## Blank Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-03174 | MBL | H3 | -0.074 | 0.719 | 2.455 | NA | U | pCi/L | ARS-040 | 1/1/15 5:46 | JPB |

## Sample RER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | RER | RER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-03174 | LCSD | H3 | 20.856 | 3.327 | 25.952 | 4.081 | | pCi/L | ARS-040 | 1/1/15 5:46 | JPB | 0.69 | < 1 |

## Sample DER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | DER | DER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-03174 | LCSD | H3 | 20.856 | 3.327 | 25.952 | 4.081 | | pCi/L | ARS-040 | 1/1/15 5:46 | JPB | 1.94 | < 3 |

Project Manager Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of ARS International.

LELAP Certificate# 01949 NELAP Certificate # E87558

# QC Evaluation

**EPA Method: ARS-040**
**Batch ID: ARS1-B14-03174**
**SDG's: ARS1-14-02964; 2965; 2966; 2999; 3000; 3204; 3205; 3206**

| | | | |
|---|---|---|---|
| **LCS** | 20.8560 | **CSU (2s)** | 6.5200 |
| **LCSD** | 25.9520 | **CSU-D (2s)** | 7.9990 |

**DER =** abs(LSC-LSCD) / sqr((2s CSU/2)^2)+(( 2s CSU-D/2)^2) *at 1 sigma* = **< 3**

**DER** 5.096 / 5.159806 = 0.98763399 **< 3**

**% RPD=** ABS( LCS - LSCD) / (LCS+LCSD)/2 * 100 = **< 25%**

**%RPD** 5.096 / 23.404 *100 = 21.7740557 **< 25%**

The *RPD* shall be less than 25% or other client-applied criteria

**RER=** abs((LCS-LCSD)) / (CSU)+(CSD) *at 2 sigma* = **<1** ***<--LANL Requirement***

**RER =** 5.096 / 14.5190 0.35098836 **<1**

**Blank Information**

| | Act | CSU(2s) | MDA | Act>MDA |
|---|---|---|---|---|
| **AM-241** | | | | |
| **U-234** | | | | |
| **U-235** | | | | |
| **U-238** | | | | |
| **Pu-238** | | | | |
| **Pu-239/240** | | | | |
| **Th-228** | | | | |
| **Th-230** | | | | |
| **Th-232** | | | | |
| **H3** | -0.074 | 1.41 | 2.455 | |
| **Ra-226** | | | | |
| **Ra-228** | | | | |
| **Total U** | | | | |
| **Pb-210** | | | | |
| **Po-209** | | | | |
| **Sr-90** | | | | |
| **TC-99** | | | | |
| **NI-63** | | | | |

*MDA should be below RDL
*Blank activity must be below MDA
*Blank activity must be < 1.65*CSU (DOE only)

ACT = -0.074
CSU = 1.41
Is ACT<1.65*CSU? YES

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-03174**

| Method | ARS-040 | Analysis | LSC-A-022 | Matrix | AQ |
|---|---|---|---|---|---|
| Description | Low Level Tritium by Electrolytic Enrichment | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-03174-01 | LCS | B-18021 | | | | | | | | |
| ARS1-B14-03174-02 | LCSD | B-18022 | | | | | | | | |
| ARS1-B14-03174-03 | MBL | | | | | | | | | |
| ARS1-B14-03174-04 | TRG | | | | **ARS1-14-02964** | 001 | 1 | CAMO-14-87134 | STD | 11/24/14 |
| ARS1-B14-03174-05 | TRG | | | | **ARS1-14-02964** | 002 | 1 | CAMO-14-87137 | STD | 11/24/14 |
| ARS1-B14-03174-06 | TRG | | | | **ARS1-14-02965** | 001 | 1 | CAPA-14-89328 | STD | 11/24/14 |
| ARS1-B14-03174-07 | TRG | | | | **ARS1-14-02966** | 001 | 1 | CAPA-14-87190 | STD | 11/24/14 |
| ARS1-B14-03174-08 | TRG | | | | **ARS1-14-02966** | 002 | 1 | CAPA-14-87192 | STD | 11/24/14 |
| ARS1-B14-03174-09 | TRG | | | | **ARS1-14-02966** | 003 | 1 | CAPA-14-87194 | STD | 11/24/14 |
| ARS1-B14-03174-10 | TRG | | | | **ARS1-14-02966** | 004 | 1 | CAPA-14-87195 | STD | 11/24/14 |
| ARS1-B14-03174-11 | TRG | | | | **ARS1-14-02966** | 005 | 1 | CAPA-14-87200 | STD | 11/24/14 |
| ARS1-B14-03174-12 | TRG | | | | **ARS1-14-02966** | 006 | 1 | CAPA-14-87201 | STD | 11/24/14 |
| ARS1-B14-03174-13 | TRG | | | | **ARS1-14-02999** | 001 | 1 | CAWR-14-89231 | STD | 11/26/14 |
| ARS1-B14-03174-14 | TRG | | | | **ARS1-14-03000** | 001 | 1 | CAPA-14-87186 | STD | 11/26/14 |
| ARS1-B14-03174-15 | TRG | | | | **ARS1-14-03204** | 001 | 1 | CAMO-15-90284 | STD | 12/15/14 |
| ARS1-B14-03174-16 | TRG | | | | **ARS1-14-03204** | 002 | 1 | CAMO-15-90267 | STD | 12/15/14 |
| ARS1-B14-03174-17 | TRG | | | | **ARS1-14-03205** | 001 | 1 | CAMO-15-90220 | STD | 12/15/14 |
| ARS1-B14-03174-18 | TRG | | | | **ARS1-14-03205** | 002 | 1 | CAMO-15-90221 | STD | 12/15/14 |
| ARS1-B14-03174-19 | TRG | | | | **ARS1-14-03205** | 003 | 1 | CAMO-15-90223 | STD | 12/15/14 |
| ARS1-B14-03174-20 | TRG | | | | **ARS1-14-03206** | 001 | 1 | CAWA-15-90397 | STD | 12/15/14 |

American Radiation Services
Baton Rouge Laboratory

# LCS Report
## Analytical Batch: ARS1-B14-03174



| BlindID | ABatch | ABatchSampleID | BlindGroup | StdID | Isotope | ExpectedAddition | ExpectedValue | EmptyWt | GrossWt | NetWt | UserID | ModDate | ExpectedValue_CT | MidPointCountDate | KnownValue |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-18021 | ARS1-B14-03174 | ARS1-B14-03174-01 | B-H3 | S-0289 | H-3 | 5 | 2.389980981 | 13.1623 | 18.2277 | 5.0654 | AMRAD\BSTEFFENS | 12/2/2014 | 2.378961916 | 1/1/2015 | 12.05039369 |
| B-18022 | ARS1-B14-03174 | ARS1-B14-03174-02 | B-H3 | S-0289 | H-3 | 5 | 2.389980981 | 13.3031 | 18.3002 | 4.9971 | AMRAD\BSTEFFENS | 12/2/2014 | 2.381895356 | 12/24/2014 | 11.90256928 |

# ARS-040



| ID_31001_040 | ABatch | AnalysisCode | ABatchSampleID | ClientID | IC_ID | S01_1_EnrichCellNo |
|---|---|---|---|---|---|---|
| 1319 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-01 | | | 63 |
| 1320 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-02 | | | 82 |
| 1321 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-03 | | | 1 |
| 1322 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-04 | CAMO-14-87134 | | 16 |
| 1323 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-05 | CAMO-14-87137 | | 26 |
| 1324 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-06 | CAPA-14-89328 | | 95 |
| 1325 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-07 | CAPA-14-87190 | | 92 |
| 1326 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-08 | CAPA-14-87192 | | 2 |
| 1327 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-09 | CAPA-14-87194 | | 3 |
| 1328 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-10 | CAPA-14-87195 | | 94 |
| 1329 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-11 | CAPA-14-87200 | | 14 |
| 1330 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-12 | CAPA-14-87201 | | 4 |
| 1331 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-13 | CAWR-14-89231 | | 5 |
| 1332 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-14 | CAPA-14-87186 | | 44 |
| 1333 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-15 | CAMO-15-90284 | | 84 |
| 1334 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-16 | CAMO-15-90267 | | 6 |
| 1335 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-17 | CAMO-15-90220 | | 59 |
| 1336 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-18 | CAMO-15-90221 | | 40 |
| 1337 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-19 | CAMO-15-90223 | | 69 |
| 1338 | ARS1-B14-03174 | LSC-A-022 | ARS1-B14-03174-20 | CAWA-15-90397 | | 9 |

| S01_2_TareCell | S01_3_TareResv | S02_GrossWtResv | S03_1_WtNa2O2 | C_GrossSampleAdded | S04_1_ElectrolSD |
|---|---|---|---|---|---|
| 320.23 | 222.25 | 734.27 | 2.01 | 512.02 | 12/05/2014 15:21:00 |
| 321.21 | 217.19 | 717.29 | 2.01 | 500.1 | 12/05/2014 15:21:00 |
| 321.64 | 201.26 | 701.43 | 2.02 | 500.17 | 12/05/2014 15:21:00 |
| 317.86 | 197.81 | 633.66 | 2.01 | 435.85 | 12/05/2014 15:21:00 |
| 333.71 | 200.81 | 596.83 | 2 | 396.02 | 12/05/2014 15:21:00 |
| 322.45 | 204.09 | 633.7 | 2.01 | 429.61 | 12/05/2014 15:21:00 |
| 328.65 | 210.86 | 643.41 | 2 | 432.55 | 12/05/2014 15:21:00 |
| 328.62 | 201.5 | 578.66 | 1.99 | 377.16 | 12/05/2014 15:21:00 |
| 318.42 | 192.61 | 632.32 | 2.02 | 439.71 | 12/05/2014 15:21:00 |
| 324.97 | 221.66 | 674.66 | 1.99 | 453 | 12/05/2014 15:21:00 |
| 333.23 | 198.37 | 653.87 | 2.02 | 455.5 | 12/05/2014 15:21:00 |
| 324.41 | 222.96 | 638.14 | 2.01 | 415.18 | 12/05/2014 15:21:00 |
| 318.13 | 263.77 | 700.7 | 2 | 436.93 | 12/05/2014 15:21:00 |
| 330.82 | 212.1 | 614.59 | 2.02 | 402.49 | 12/05/2014 15:21:00 |
| 331.16 | 220.24 | 721.22 | 2.02 | 500.98 | 12/05/2014 15:21:00 |
| 320.86 | 196.52 | 707.04 | 1.99 | 510.52 | 12/05/2014 15:21:00 |
| 323.84 | 198.98 | 699.4 | 2.01 | 500.42 | 12/05/2014 15:21:00 |
| 322.6 | 202.08 | 702.26 | 2.01 | 500.18 | 12/05/2014 15:21:00 |
| 323.56 | 221.72 | 723.52 | 1.99 | 501.8 | 12/05/2014 15:21:00 |
| 329.88 | 206.86 | 706.91 | 2.01 | 500.05 | 12/05/2014 15:21:00 |

| S04_2_StartAmp | S04_3_StartBathC | S05_1_ElectrolED | S05_2_EndBathC | S05_3_EndCellWt | C_GrossSmplRec |
|---|---|---|---|---|---|
| 5 | 2 | 12/31/2014 10:10:00 | 2 | 559.31 | 16.83 |
| 5 | 2 | 12/23/2014 08:45:00 | 2 | 554.7 | 16.3 |
| 5 | 2 | 12/22/2014 14:12:00 | 2 | 539.53 | 16.63 |
| 5 | 2 | 12/22/2014 14:16:00 | 2 | 532.37 | 16.7 |
| 5 | 2 | 12/22/2014 14:20:00 | 2 | 550 | 15.48 |
| 5 | 2 | 12/22/2014 14:22:00 | 2 | 543.26 | 16.72 |
| 5 | 2 | 12/22/2014 14:25:00 | 2 | 555.47 | 15.96 |
| 5 | 2 | 12/30/2014 00:00:00 | 2 | 547.09 | 16.97 |
| 5 | 2 | 12/22/2014 14:29:00 | 2 | 527.21 | 16.18 |
| 5 | 2 | 12/23/2014 09:46:00 | 2 | 562 | 15.37 |
| 5 | 2 | 12/22/2014 12:32:00 | 2 | 547.32 | 15.72 |
| 5 | 2 | 12/22/2014 14:34:00 | 2 | 561.33 | 13.96 |
| 5 | 2 | 12/23/2014 09:50:00 | 2 | 598.61 | 16.71 |
| 5 | 2 | 12/31/2014 10:10:00 | 2 | 558.82 | 15.9 |
| 5 | 2 | 12/22/2014 01:00:00 | 2 | 563.7 | 12.3 |
| 5 | 2 | 01/01/2015 00:00:00 | 2 | 531.32 | 13.94 |
| 5 | 2 | 01/01/2015 13:53:00 | 2 | 539.37 | 16.55 |
| 5 | 2 | 01/01/2015 10:59:00 | 2 | 541.5 | 16.82 |
| 5 | 2 | 01/01/2015 11:00:00 | 2 | 562.25 | 16.97 |
| 5 | 2 | 01/01/2015 13:52:00 | 2 | 553.3 | 16.56 |

| C_EnrichmentF | S06_TareWt | S07_GrossWt | C_RecoveredWa | S08_TearWtLSCVial | S09_VialPlusSmpl | C_NetSample |
|---|---|---|---|---|---|---|
| 30.42305407 | 99.71 | 112.2 | 12.49 | 6.48 | 16.51 | 10.03 |
| 30.6809816 | 109.47 | 119.75 | 10.28 | 6.38 | 16.38 | 10 |
| 30.07636801 | 103.12 | 113.56 | 10.44 | 6.57 | 16.59 | 10.02 |
| 26.0988024 | 117.1 | 128.97 | 11.87 | 6.55 | 16.56 | 10.01 |
| 25.58268734 | 96.21 | 107.43 | 11.22 | 6.55 | 16.55 | 10 |
| 25.69437799 | 113.92 | 125.79 | 11.87 | 6.56 | 16.56 | 10 |
| 27.10213033 | 101.84 | 112.67 | 10.83 | 6.47 | 16.47 | 10 |
| 22.22510312 | 109.14 | 121.34 | 12.2 | 6.52 | 16.55 | 10.03 |
| 27.17614339 | 92.35 | 102.62 | 10.27 | 6.62 | 16.62 | 10 |
| 29.47299935 | 110.22 | 119.65 | 9.43 | 6.46 | 14.55 | 8.09 |
| 28.97582697 | 116.87 | 128.75 | 11.88 | 6.43 | 16.49 | 10.06 |
| 29.74068768 | 102.34 | 112.19 | 9.85 | 6.53 | 16.07 | 9.54 |
| 26.14781568 | 95.88 | 108.08 | 12.2 | 6.52 | 16.58 | 10.06 |
| 25.31383648 | 109.12 | 119.53 | 10.41 | 6.37 | 16.4 | 10.03 |
| 40.7300813 | 109.65 | 118.05 | 8.4 | 6.58 | 14.9 | 8.32 |
| 36.62266858 | 109.14 | 121.46 | 12.32 | 6.49 | 16.51 | 10.02 |
| 30.23685801 | 115.54 | 128.86 | 13.32 | 6.54 | 16.55 | 10.01 |
| 29.7372176 | 104.95 | 118.47 | 13.52 | 6.53 | 16.57 | 10.04 |
| 29.56982911 | 93.29 | 105.08 | 11.79 | 6.47 | 16.5 | 10.03 |
| 30.19625604 | 107.31 | 120.16 | 12.85 | 6.52 | 16.56 | 10.04 |

| S10_1_WtVislSmplDrWatFill | C_NetDeadWaterAdded | C_TareWtBFCocktail | S10_2_GrossWtVSC | C_NetWtCocktailAdded |
|---|---|---|---|---|
| 16.51 | 0 | 16.51 | 26.47 | 9.96 |
| 16.38 | 0 | 16.38 | 26.32 | 9.94 |
| 16.59 | 0 | 16.59 | 26.51 | 9.92 |
| 0 | 0 | 16.56 | 26.49 | 9.93 |
| 0 | 0 | 16.55 | 26.49 | 9.94 |
| 0 | 0 | 16.56 | 26.51 | 9.95 |
| 0 | 0 | 16.47 | 26.4 | 9.93 |
| 16.55 | 0 | 16.55 | 26.55 | 10 |
| 0 | 0 | 16.62 | 26.56 | 9.94 |
| 16.48 | 1.93 | 16.48 | 26.43 | 9.95 |
| 16.49 | 0 | 16.49 | 26.46 | 9.97 |
| 16.56 | 0.49 | 16.56 | 26.56 | 10 |
| 16.58 | 0 | 16.58 | 26.58 | 10 |
| 16.4 | 0 | 16.4 | 26.36 | 9.96 |
| 16.6 | 1.7 | 16.6 | 26.57 | 9.97 |
| 16.51 | 0 | 16.51 | 26.47 | 9.96 |
| 16.55 | 0 | 16.55 | 26.5 | 9.95 |
| 16.57 | 0 | 16.57 | 26.54 | 9.97 |
| 16.5 | 0 | 16.5 | 26.45 | 9.95 |
| 16.56 | 0 | 16.56 | 26.55 | 9.99 |

| UserID | ModDate |
|---|---|
| AMRAD\JBYRD | 12/31/2014 13:22:08 |
| AMRAD\KGANDBHIR | 12/23/2014 15:21:21 |
| AMRAD\KGANDBHIR | 12/23/2014 13:47:24 |
| AMRAD\KGANDBHIR | 12/23/2014 13:54:35 |
| AMRAD\KGANDBHIR | 12/23/2014 14:00:30 |
| AMRAD\KGANDBHIR | 12/23/2014 14:07:51 |
| AMRAD\KGANDBHIR | 12/23/2014 14:50:53 |
| AMRAD\JBYRD | 12/30/2014 18:12:39 |
| AMRAD\KGANDBHIR | 12/23/2014 14:55:50 |
| AMRAD\KGANDBHIR | 12/23/2014 15:05:08 |
| AMRAD\JBYRD | 12/31/2014 13:27:14 |
| AMRAD\JBYRD | 12/30/2014 18:21:16 |
| AMRAD\JBYRD | 12/30/2014 18:25:25 |
| AMRAD\JBYRD | 12/31/2014 13:43:48 |
| AMRAD\JBYRD | 12/31/2014 13:48:19 |
| AMRAD\JBYRD | 01/01/2015 14:07:21 |
| AMRAD\JBYRD | 01/01/2015 15:16:04 |
| AMRAD\JBYRD | 01/01/2015 14:13:09 |
| AMRAD\JBYRD | 01/01/2015 14:17:00 |
| AMRAD\JBYRD | 01/01/2015 15:19:30 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141223_2217
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141223_2217\20141223_2217.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141223_2217\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20141223_2217\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 240.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

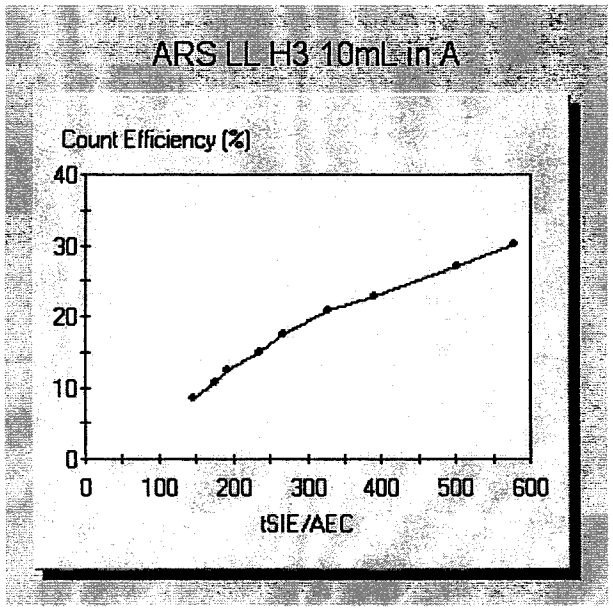
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

Protocol# 2 - Low Level H3.lsa User: H3 Low Level

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | BACKGROUND | 1.129 | 4.97 | 383.57 | 22.72 | 240.00 | 12/23/2014 | 10:26:45 PM | |
| 2 | 2 | B14-03174-02 | 4.319 | 19.17 | 378.17 | 22.53 | 240.00 | 12/24/2014 | 2:37:49 AM | |
| 2 | 3 | B14-03174-03 | 1.119 | 4.97 | 377.72 | 22.51 | 240.00 | 12/24/2014 | 6:48:55 AM | |
| 2 | 4 | B14-03174-04 | 1.079 | 4.77 | 381.10 | 22.63 | 240.00 | 12/24/2014 | 11:00:03 AM | |
| 2 | 5 | B14-03174-05 | 1.068 | 4.72 | 380.83 | 22.62 | 240.00 | 12/24/2014 | 3:11:07 PM | |
| 2 | 6 | B14-03174-06 | 1.208 | 5.39 | 375.07 | 22.42 | 240.00 | 12/24/2014 | 7:22:11 PM | |
| 2 | 7 | B14-03174-07 | 1.052 | 4.68 | 377.59 | 22.51 | 240.00 | 12/24/2014 | 11:33:14 PM | |
| 2 | 8 | B14-03174-09 | 1.084 | 4.80 | 379.64 | 22.58 | 240.00 | 12/25/2014 | 3:44:19 AM | |
| 2 | 9 | B14-03174-10 | 1.137 | 5.18 | 361.32 | 21.94 | 240.00 | 12/25/2014 | 7:55:23 AM | |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141231_0842
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141231_0842\20141231_0842.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141231_0842\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141231_0842\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 240.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

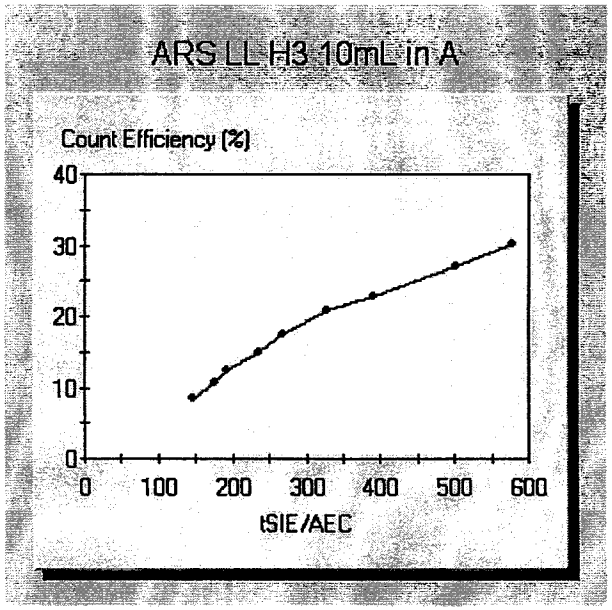
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

Protocol# 10 - Low Level H3_3.lsa User: H3 Low Level

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 1 | BACKGROUND | 1.156 | 4.89 | 408.85 | 23.63 | 240.00 | 12/31/2014 | 8:51:16 AM | |
| 10 | 2 | B14-03174-08 | 1.162 | 4.99 | 399.13 | 23.28 | 240.00 | 12/31/2014 | 1:02:19 PM | |
| 10 | 3 | B14-03174-12 | 1.111 | 4.71 | 408.31 | 23.61 | 240.00 | 12/31/2014 | 5:13:18 PM | |
| 10 | 4 | B14-03174-13 | 1.016 | 4.39 | 396.05 | 23.17 | 240.00 | 12/31/2014 | 9:24:16 PM | |
| 10 | 5 | B14-03174-11 | 1.069 | 4.63 | 393.72 | 23.08 | 240.00 | 1/1/2015 | 1:35:17 AM | |
| 10 | 6 | B14-03174-01 | 3.761 | 16.08 | 402.02 | 23.38 | 240.00 | 1/1/2015 | 5:46:19 AM | |
| 10 | 7 | B14-03174-14 | 3.774 | 16.22 | 398.83 | 23.27 | 240.00 | 1/1/2015 | 9:57:22 AM | |
| 10 | 8 | B14-03174-15 | 1.169 | 4.92 | 412.68 | 23.77 | 240.00 | 1/1/2015 | 2:08:23 PM | |
| 10 | 9 | B14-03174-16 | 1.208 | 5.20 | 397.22 | 23.21 | 240.00 | 1/1/2015 | 6:19:23 PM | |
| 10 | 10 | B14-03174-18 | 1.103 | 4.71 | 402.68 | 23.41 | 240.00 | 1/1/2015 | 10:30:25 PM | |
| 10 | 11 | B14-03174-19 | 2.504 | 10.51 | 413.93 | 23.82 | 240.00 | 1/2/2015 | 2:41:26 AM | |
| 10 | 12 | B14-03174-20 | 1.193 | 5.34 | 372.75 | 22.34 | 240.00 | 1/2/2015 | 6:52:27 AM | |
| 10 | 13 | B14-03174-17 | 2.247 | 9.51 | 408.39 | 23.62 | 240.00 | 1/2/2015 | 11:03:38 AM | |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-03174 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Initial_Mass_sample_g | Mass_Na2O2_added_g | Final_mass_electrolyzed_sample_NaOH_g | Mass_equivalent_NaOH_g | Final_Mass_Electrolyzed_sample_g | VolumeFactor_X | Enrichment_Factor_Y |
|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-03174-01 | 512.020 | 2.010 | 16.830 | 2.062 | 14.768 | 0.029 | 27.117 |
| LSC-A-022 | ARS1-B14-03174-02 | 500.100 | 2.010 | 16.300 | 2.062 | 14.238 | 0.028 | 27.458 |
| LSC-A-022 | ARS1-B14-03174-03 | 500.170 | 2.020 | 16.630 | 2.073 | 14.557 | 0.029 | 26.882 |
| LSC-A-022 | ARS1-B14-03174-04 | 435.850 | 2.010 | 16.700 | 2.062 | 14.638 | 0.034 | 23.427 |
| LSC-A-022 | ARS1-B14-03174-05 | 396.020 | 2.000 | 15.480 | 2.052 | 13.428 | 0.034 | 23.212 |
| LSC-A-022 | ARS1-B14-03174-06 | 429.610 | 2.010 | 16.720 | 2.062 | 14.658 | 0.034 | 23.074 |
| LSC-A-022 | ARS1-B14-03174-07 | 432.550 | 2.000 | 15.960 | 2.052 | 13.908 | 0.032 | 24.428 |
| LSC-A-022 | ARS1-B14-03174-08 | 377.160 | 1.990 | 16.970 | 2.042 | 14.928 | 0.040 | 20.005 |
| LSC-A-022 | AR51-B14-03174-09 | 439.710 | 2.020 | 16.180 | 2.073 | 14.107 | 0.032 | 24.479 |
| LSC-A-022 | ARS1-B14-03174-10 | 453.000 | 1.990 | 15.370 | 2.042 | 13.328 | 0.029 | 26.603 |
| LSC-A-022 | ARS1-B14-03174-11 | 455.500 | 2.020 | 15.720 | 2.073 | 13.647 | 0.030 | 26.143 |
| LSC-A-022 | ARS1-B14-03174-12 | 415.180 | 2.010 | 13.960 | 2.062 | 11.898 | 0.029 | 27.286 |
| LSC-A-022 | ARS1-B14-03174-13 | 436.930 | 2.000 | 16.710 | 2.052 | 14.658 | 0.034 | 23.451 |
| LSC-A-022 | ARS1-B14-03174-14 | 402.490 | 2.020 | 15.900 | 2.073 | 13.827 | 0.034 | 22.921 |
| LSC-A-022 | ARS1-B14-03174-15 | 500.980 | 2.020 | 12.300 | 2.073 | 10.227 | 0.020 | 37.800 |
| LSC-A-022 | ARS1-B14-03174-16 | 510.520 | 1.990 | 13.940 | 2.042 | 11.898 | 0.023 | 33.282 |
| LSC-A-022 | ARS1-B14-03174-17 | 500.420 | 2.010 | 16.550 | 2.062 | 14.488 | 0.029 | 27.019 |
| LSC-A-022 | ARS1-B14-03174-18 | 500.180 | 2.010 | 16.820 | 2.062 | 14.758 | 0.030 | 26.532 |
| LSC-A-022 | ARS1-B14-03174-19 | 501.800 | 1.990 | 16.970 | 2.042 | 14.928 | 0.030 | 26.322 |
| LSC-A-022 | ARS1-B14-03174-20 | 500.050 | 2.010 | 16.560 | 2.062 | 14.498 | 0.029 | 26.982 |
| | | | | | | | | |

# Standards Activity as of: 01/01/15 05:46

| Active | Std ID | Isotope | PSCLT | Verification Date | Exp Date | Status | Ref Date | Ref ACT (dpm) | ACT at Date Above (dpm/g) | Halflife (days) | Parent ID | Expended Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | **S-0289** | H-3 | **SL** | 01/07/14 | 01/07/15 | OK | 01/03/13 | 5.9080E+00 | **5.2813** | 4.500E+03 | **S-0237** | |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-03174 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Average_Sample_CPM | Bkg_CPM | tSIE | Detector_Eff_decimal | Aliquot | AliqUnits | Activity_reference_date | Start_Date_of_Count | Sample_Count_Duration_min |
|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-03174-01 | 3.761 | 1.129 | 402.020 | 0.234 | 0.01003 | L | 1/3/2013 | 1/1/2015 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-02 | 4.319 | 1.129 | 378.170 | 0.225 | 0.01000 | L | 1/3/2013 | 12/24/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-03 | 1.119 | 1.129 | 377.720 | 0.225 | 0.01002 | L | 12/23/2014 | 12/24/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-04 | 1.079 | 1.129 | 381.100 | 0.226 | 0.01001 | L | 10/23/2014 | 12/24/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-05 | 1.068 | 1.129 | 380.830 | 0.226 | 0.01000 | L | 10/28/2014 | 12/24/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-06 | 1.208 | 1.129 | 375.070 | 0.224 | 0.01000 | L | 10/27/2014 | 12/24/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-07 | 1.052 | 1.129 | 377.590 | 0.225 | 0.01000 | L | 10/28/2014 | 12/24/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-08 | 1.162 | 1.129 | 399.130 | 0.233 | 0.01003 | L | 10/28/2014 | 12/31/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-09 | 1.084 | 1.129 | 379.640 | 0.226 | 0.01000 | L | 10/27/2014 | 12/25/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-10 | 1.137 | 1.129 | 361.320 | 0.219 | 0.00809 | L | 10/24/2014 | 12/25/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-11 | 1.069 | 1.129 | 393.720 | 0.231 | 0.01006 | L | 10/23/2014 | 1/1/2015 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-12 | 1.111 | 1.129 | 408.310 | 0.236 | 0.00954 | L | 10/23/2014 | 12/31/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-13 | 1.016 | 1.129 | 396.050 | 0.232 | 0.01006 | L | 10/29/2014 | 12/31/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-14 | 3.774 | 1.129 | 398.830 | 0.233 | 0.01003 | L | 10/29/2014 | 1/1/2015 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-15 | 1.169 | 1.129 | 412.680 | 0.238 | 0.00832 | L | 11/17/2014 | 1/1/2015 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-16 | 1.208 | 1.129 | 397.220 | 0.232 | 0.01002 | L | 11/17/2014 | 1/1/2015 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-17 | 2.247 | 1.129 | 408.390 | 0.236 | 0.01001 | L | 11/14/2014 | 1/2/2015 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-18 | 1.103 | 1.129 | 402.680 | 0.234 | 0.01004 | L | 11/13/2014 | 1/1/2015 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-19 | 2.504 | 1.129 | 413.930 | 0.238 | 0.01003 | L | 11/17/2014 | 1/2/2015 | 240.000 |
| LSC-A-022 | ARS1-B14-03174-20 | 1.193 | 1.129 | 372.750 | 0.223 | 0.01004 | L | 11/18/2014 | 1/2/2015 | 240.000 |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-03174 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Total_Bkg_Count_Duration_min | DF | Sample_Activity_Conc | Standard_Counting_Uncertainty | CU_1 | CSU_1 | CU_1_96 | CSU_1_96 | MDC | DLC | ActivityReportUnits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-03174-01 | 240.000 | 0.89392 | 20.856 | 1.131 | 1.131 | 3.327 | 2.217 | 6.520 | 2.618 | 1.264 | pCi |
| LSC-A-022 | AR51-B14-03174-02 | 240.000 | 0.89503 | 25.952 | 1.226 | 1.226 | 4.081 | 2.402 | 7.999 | 2.688 | 1.298 | pCi |
| LSC-A-022 | ARS1-B14-03174-03 | 240.000 | 0.99985 | -0.074 | 0.719 | 0.719 | 0.719 | 1.409 | 1.410 | 2.455 | 1.186 | pCi |
| LSC-A-022 | ARS1-B14-03174-04 | 240.000 | 0.99050 | -0.428 | 0.822 | 0.822 | 0.824 | 1.611 | 1.616 | 2.832 | 1.367 | pCi |
| LSC-A-022 | ARS1-B14-03174-05 | 240.000 | 0.99126 | -0.528 | 0.828 | 0.828 | 0.832 | 1.623 | 1.630 | 2.860 | 1.381 | pCi |
| LSC-A-022 | ARS1-B14-03174-06 | 240.000 | 0.99111 | 0.694 | 0.867 | 0.867 | 0.873 | 1.699 | 1.711 | 2.903 | 1.402 | pCi |
| LSC-A-022 | ARS1-B14-03174-07 | 240.000 | 0.99111 | -0.636 | 0.788 | 0.788 | 0.794 | 1.544 | 1.556 | 2.731 | 1.319 | pCi |
| LSC-A-022 | ARS1-B14-03174-08 | 240.000 | 0.99019 | 0.321 | 0.952 | 0.952 | 0.953 | 1.865 | 1.867 | 3.218 | 1.554 | pCi |
| LSC-A-022 | ARS1-B14-03174-09 | 240.000 | 0.99095 | -0.370 | 0.790 | 0.790 | 0.792 | 1.548 | 1.552 | 2.717 | 1.312 | pCi |
| LSC-A-022 | ARS1-B14-03174-10 | 240.000 | 0.99050 | 0.077 | 0.936 | 0.936 | 0.936 | 1.834 | 1.834 | 3.182 | 1.537 | pCi |
| LSC-A-022 | ARS1-B14-03174-11 | 240.000 | 0.98928 | -0.450 | 0.718 | 0.718 | 0.721 | 1.407 | 1.413 | 2.479 | 1.197 | pCi |
| LSC-A-022 | ARS1-B14-03174-12 | 240.000 | 0.98943 | -0.133 | 0.716 | 0.716 | 0.716 | 1.403 | 1.403 | 2.448 | 1.182 | pCi |
| LSC-A-022 | ARS1-B14-03174-13 | 240.000 | 0.99019 | -0.940 | 0.787 | 0.787 | 0.799 | 1.542 | 1.567 | 2.750 | 1.328 | pCi |
| LSC-A-022 | ARS1-B14-03174-14 | 240.000 | 0.99019 | 22.491 | 1.215 | 1.215 | 3.586 | 2.382 | 7.028 | 2.810 | 1.357 | pCi |
| LSC-A-022 | ARS1-B14-03174-15 | 240.000 | 0.99309 | 0.243 | 0.594 | 0.594 | 0.595 | 1.164 | 1.166 | 2.005 | 0.968 | pCi |
| LSC-A-022 | ARS1-B14-03174-16 | 240.000 | 0.99309 | 0.463 | 0.578 | 0.578 | 0.582 | 1.133 | 1.142 | 1.936 | 0.935 | pCi |
| LSC-A-022 | ARS1-B14-03174-17 | 240.000 | 0.99248 | 7.943 | 0.843 | 0.843 | 1.459 | 1.652 | 2.860 | 2.347 | 1.134 | pCi |
| LSC-A-022 | ARS1-B14-03174-18 | 240.000 | 0.99233 | -0.189 | 0.702 | 0.702 | 0.703 | 1.376 | 1.377 | 2.405 | 1.161 | pCi |
| LSC-A-022 | ARS1-B14-03174-19 | 240.000 | 0.99294 | 9.919 | 0.888 | 0.888 | 1.732 | 1.740 | 3.396 | 2.384 | 1.151 | pCi |
| LSC-A-022 | ARS1-B14-03174-20 | 240.000 | 0.99309 | 0.480 | 0.737 | 0.737 | 0.741 | 1.445 | 1.452 | 2.476 | 1.196 | pCi |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-03174 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | AliquotReportUnits | UserID | ModDate |
|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-03174-01 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-02 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-03 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-04 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-05 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-06 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-07 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-08 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-09 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-10 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-11 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-12 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-13 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-14 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-15 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-16 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-17 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-18 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-19 | L | AMRAD\JBYRD | 1/5/2015 |
| LSC-A-022 | ARS1-B14-03174-20 | L | AMRAD\JBYRD | 1/5/2015 |
| | | | | |

**ARS Batch Number:** ARS1-B14 - 03174

| Enter these Values for LCS | | | |
|---|---|---|---|
| | Current ACT | 5.2813 | Standards Report |
| | NetWt | 5.0654 | LCS Report |
| | Aliquot | 0.5120 | Procedural Data Report |

| Enter these Values for LCSD | | | |
|---|---|---|---|
| | Current ACT | 5.2813 | Standards Report |
| | NetWt | 4.9971 | LCS Report |
| | Aliquot | 0.5001 | Procedural Data Report |

## Expected Value Calculations

**ARS Batch Number:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **LCS** | **CALCULATED EXPECTED VALUE** | = | 23.5350 | | | |
| | | | **Range** | 17.6513 | - | 29.4188 |
| **LCSD** | **CALCULATED EXPECTED VALUE** | = | 23.7711 | | | |
| | | | **Range** | 17.8283 | - | 29.7139 |

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 12-23-14 | 7:37 | B14-03536-04 | B14-03536 | 0917 | [illegible] |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | [illegible] |
| 12-30-14 | 18:01 | SNC 16 | QA | QA | [illegible] |
| ↓ | ↓ | Background | B14-03626 | 19:42 | [illegible] |
| ↓ | ↓ | B14-03626-04 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | [illegible] |
| 12-30-14 | 18:01 | Background | B14-03174 | 0842 | [illegible] |
| ↓ | ↓ | B14-03174-01 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | -02 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | -03 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | -04 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | -05 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | -06 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | -07 | ↓ | ↓ | [illegible] |



Reviewed By: SDL Initials Date: 1-5-15 SDL

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 12-31-14 | 18:01 | B14-03174-08 | B14-03174 | 0842 | JB |
| | | -09 | | | JB |
| | | -10 | | | JB |
| | | -11 | | | JB |
| | | -12 | | | JB |
| | | -13 | | | JB |
| | | -14 | | | JB |
| | | -15 | | | JB |
| | | -16 | | | JB |
| | | -17 | | | JB |
| | | -18 | | | JB |
| | | -19 | | | JB |
| | | -20 | | | JB |
| | | | | | |
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| | | | | | |

1-5-15



Reviewed By: _____ Date: 1-5-15
Initials

INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

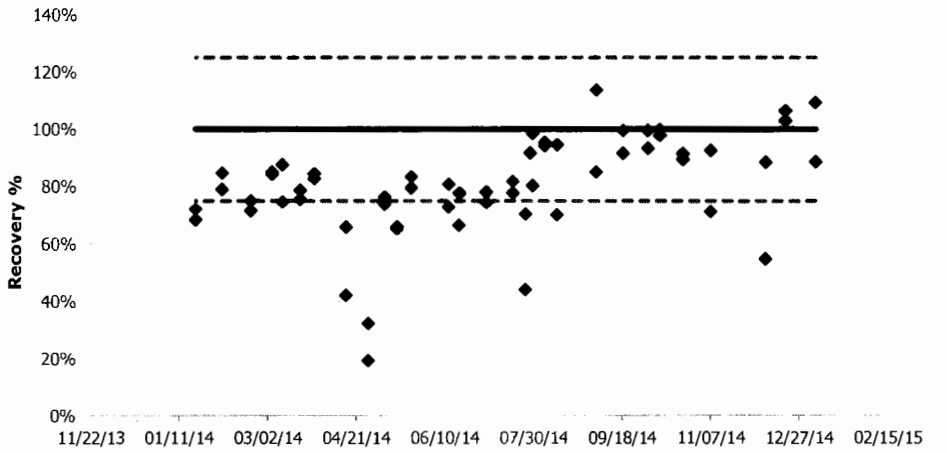
# Control Charts

American Radiation Services
Baton Rouge Laboratory

# QC Chart

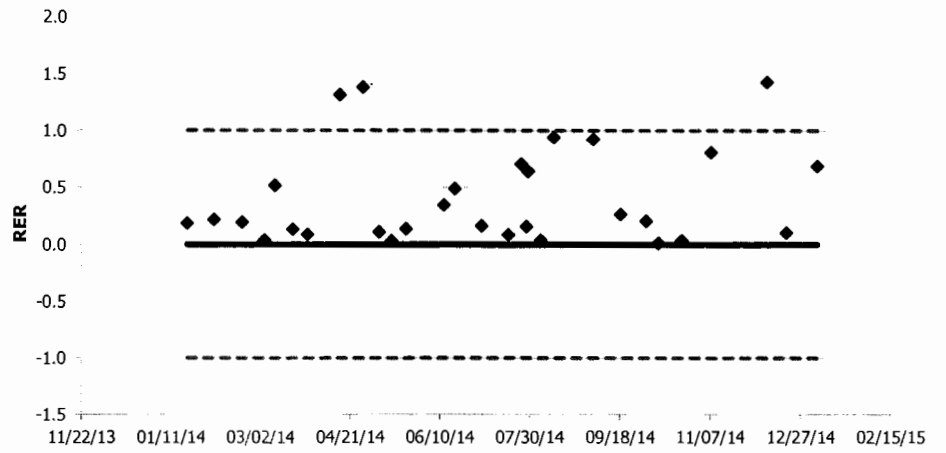


## LLH-3 LCS



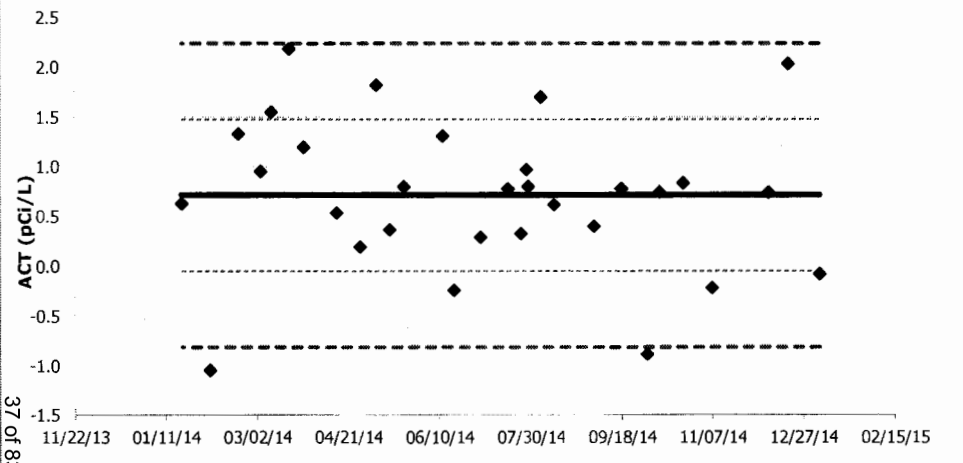

| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.8039 | 0.1737 | 30 | 1.2500 | 0.7500 |

## LLH-3 RER



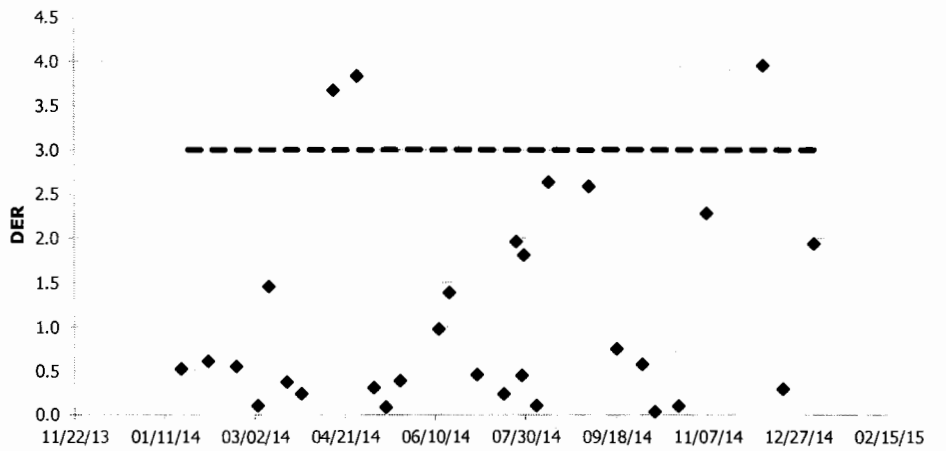

| | | n | UCL | LCL |
|---|---|---|---|---|
| | | 30 | 1.0000 | -1.0000 |

## LLH-3 Blank




| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.7141 | 0.7622 | 30 | 2.2384 | -0.8102 |

## LLH-3 DER



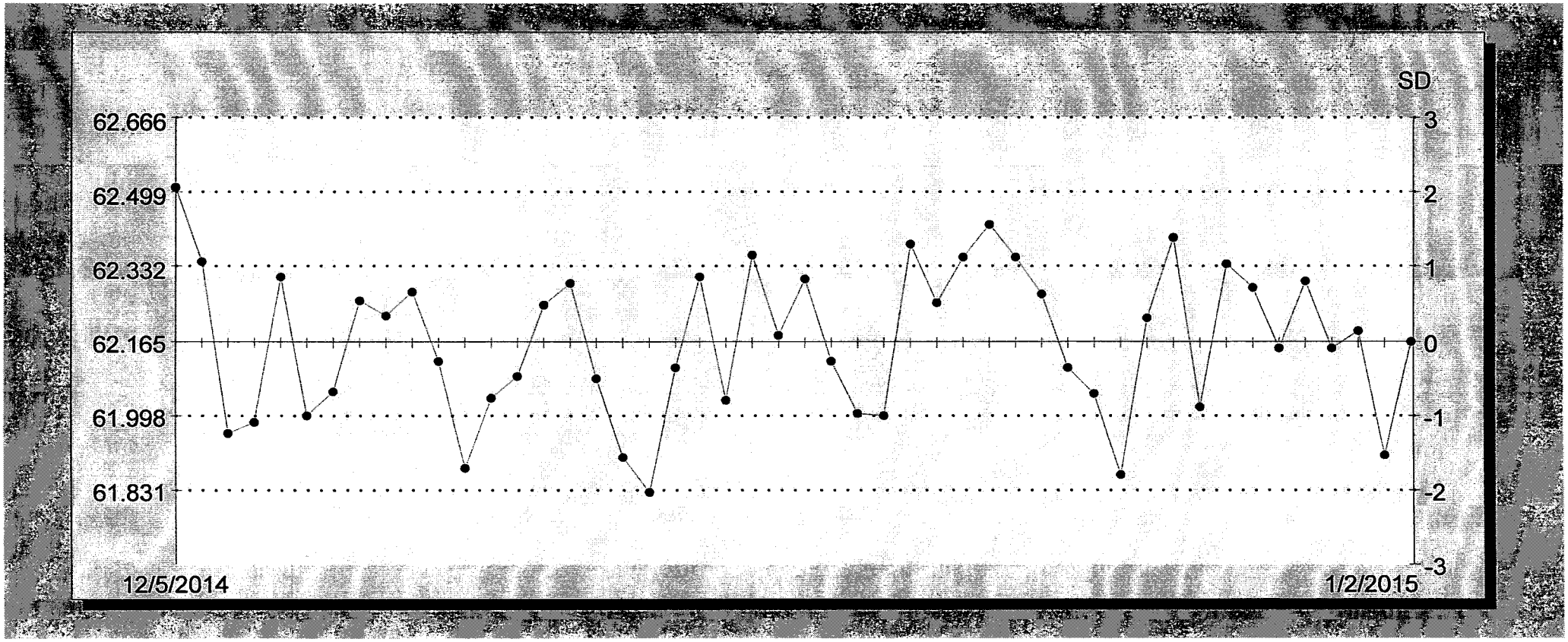

| | | n | UCL | |
|---|---|---|---|---|
| | | 30 | 3.0000 | |

3H Efficiency
Total # pts : 5993
Valid # pts : 48
Mean : 62.17
SD : 0.17

| Date | Value | Valid Pt |
|---|---|---|
| Dec 05, 2014 | 62.51 | X |
| Dec 09, 2014 | 62.35 | X |
| Dec 11, 2014 | 61.96 | X |
| Dec 12, 2014 | 61.98 | X |
| Dec 12, 2014 | 62.31 | X |
| Dec 12, 2014 | 62.00 | X |
| Dec 12, 2014 | 62.05 | X |
| Dec 13, 2014 | 62.26 | X |
| Dec 13, 2014 | 62.22 | X |
| Dec 13, 2014 | 62.28 | X |
| Dec 13, 2014 | 62.12 | X |
| Dec 13, 2014 | 61.88 | X |
| Dec 13, 2014 | 62.04 | X |
| Dec 13, 2014 | 62.09 | X |
| Dec 13, 2014 | 62.25 | X |
| Dec 13, 2014 | 62.30 | X |
| Dec 13, 2014 | 62.08 | X |
| Dec 13, 2014 | 61.90 | X |
| Dec 13, 2014 | 61.83 | X |
| Dec 13, 2014 | 62.11 | X |
| Dec 13, 2014 | 62.31 | X |
| Dec 13, 2014 | 62.03 | X |
| Dec 14, 2014 | 62.36 | X |
| Dec 14, 2014 | 62.18 | X |
| Dec 14, 2014 | 62.31 | X |
| Dec 14, 2014 | 62.12 | X |
| Dec 14, 2014 | 62.00 | X |
| Dec 14, 2014 | 62.00 | X |
| Dec 14, 2014 | 62.38 | X |
| Dec 14, 2014 | 62.25 | X |
| Dec 14, 2014 | 62.36 | X |
| Dec 14, 2014 | 62.43 | X |
| Dec 14, 2014 | 62.35 | X |
| Dec 14, 2014 | 62.27 | X |
| Dec 14, 2014 | 62.10 | X |
| Dec 14, 2014 | 62.04 | X |
| Dec 15, 2014 | 61.86 | X |
| Dec 15, 2014 | 62.22 | X |
| Dec 15, 2014 | 62.40 | X |
| Dec 15, 2014 | 62.02 | X |
| Dec 15, 2014 | 62.34 | X |
| Dec 15, 2014 | 62.28 | X |

| | | |
|---|---|---|
| Dec 16, 2014 | 62.15 | X |
| Dec 19, 2014 | 62.30 | X |
| Dec 23, 2014 | 62.15 | X |
| Dec 25, 2014 | 62.19 | X |
| Dec 30, 2014 | 61.91 | X |
| Jan 02, 2015 | 62.16 | X |

3H Efficiency
Total # pts : 5993
Valid # pts : 48
Mean : 62.17
SD : 0.17

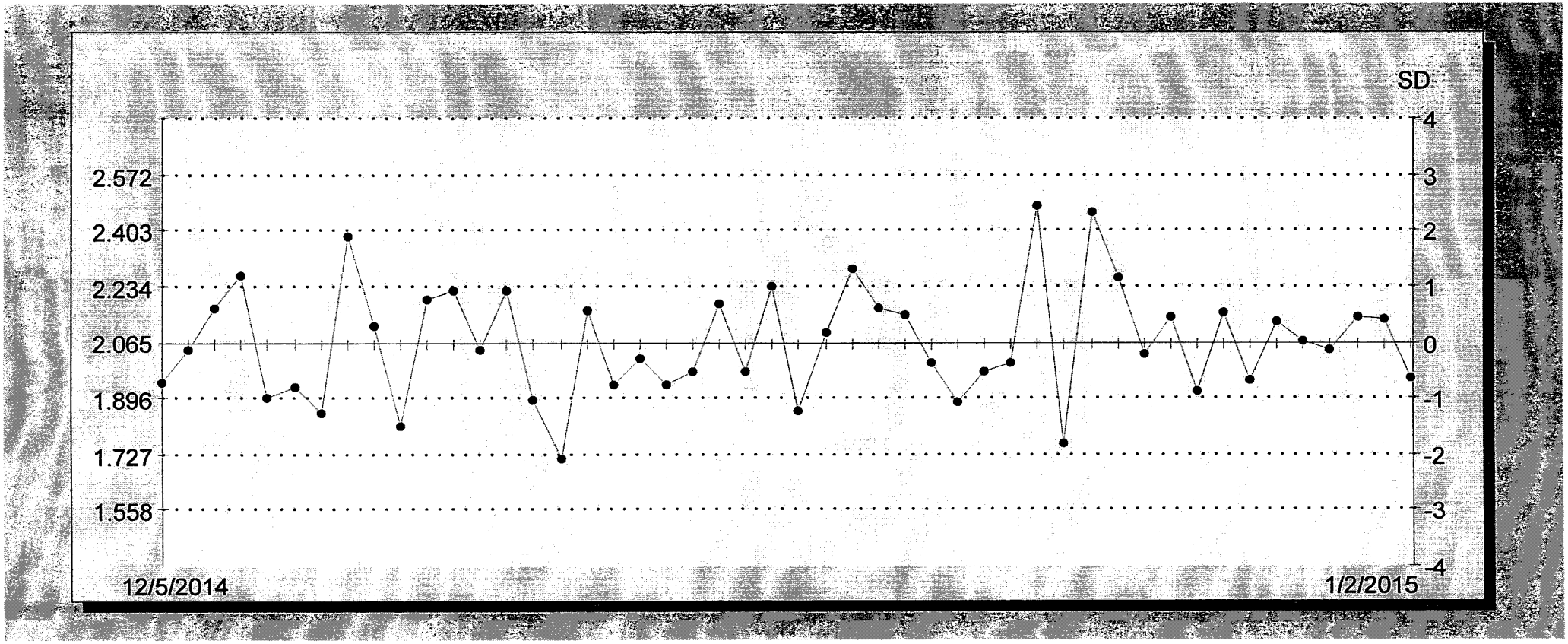


3H Background
Total # pts : 5918
Valid # pts : 48
Mean : 2.06
SD : 0.17

| Date | Value | Valid Pt |
|---|---|---|
| Dec 05, 2014 | 1.95 | X |
| Dec 09, 2014 | 2.04 | X |
| Dec 11, 2014 | 2.17 | X |
| Dec 12, 2014 | 2.27 | X |
| Dec 12, 2014 | 1.90 | X |
| Dec 12, 2014 | 1.93 | X |
| Dec 12, 2014 | 1.85 | X |
| Dec 13, 2014 | 2.38 | X |
| Dec 13, 2014 | 2.12 | X |
| Dec 13, 2014 | 1.81 | X |
| Dec 13, 2014 | 2.19 | X |
| Dec 13, 2014 | 2.22 | X |
| Dec 13, 2014 | 2.04 | X |
| Dec 13, 2014 | 2.22 | X |
| Dec 13, 2014 | 1.89 | X |
| Dec 13, 2014 | 1.71 | X |
| Dec 13, 2014 | 2.16 | X |
| Dec 13, 2014 | 1.94 | X |
| Dec 13, 2014 | 2.02 | X |
| Dec 13, 2014 | 1.93 | X |
| Dec 13, 2014 | 1.97 | X |
| Dec 13, 2014 | 2.18 | X |
| Dec 14, 2014 | 1.97 | X |
| Dec 14, 2014 | 2.23 | X |
| Dec 14, 2014 | 1.86 | X |
| Dec 14, 2014 | 2.09 | X |
| Dec 14, 2014 | 2.29 | X |
| Dec 14, 2014 | 2.17 | X |
| Dec 14, 2014 | 2.15 | X |
| Dec 14, 2014 | 2.00 | X |
| Dec 14, 2014 | 1.88 | X |
| Dec 14, 2014 | 1.98 | X |
| Dec 14, 2014 | 2.00 | X |
| Dec 14, 2014 | 2.48 | X |
| Dec 14, 2014 | 1.76 | X |
| Dec 14, 2014 | 2.45 | X |
| Dec 15, 2014 | 2.26 | X |
| Dec 15, 2014 | 2.03 | X |
| Dec 15, 2014 | 2.14 | X |
| Dec 15, 2014 | 1.92 | X |
| Dec 15, 2014 | 2.16 | X |
| Dec 15, 2014 | 1.95 | X |

| | | |
|---|---|---|
| Dec 16, 2014 | 2.13 | X |
| Dec 19, 2014 | 2.07 | X |
| Dec 23, 2014 | 2.04 | X |
| Dec 25, 2014 | 2.14 | X |
| Dec 30, 2014 | 2.13 | X |
| Jan 02, 2015 | 1.96 | X |

3H Background
Total # pts : 5918
Valid # pts : 48
Mean : 2.06
SD : 0.17



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# American Radiation Services Analytical Reports

## for

## Los Alamos National Laboratory

# Tritium- Screening by Low Level Liquid Scintillation Counting

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting

# Samples

***Procedures:*** **ARS-060** **ARS-040** *Section 14.1 Tritium Screen in Clean Water without Distillation*

***ARS File ID Numbers:*** **ARS1-14-02964; 2965; 2966; 2999; 3000**
***ARS Batch ID:*** **ARS1-B14-02771**

| | Sample ID: | COUNT TIME | CPMA | Background CPMA | Eff Nucl In A | Aliquot (grams) | ACTIVITY | units | MDA | Sample Must be analyzed as LSC-A-001 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | B14-02771-04 | 120 | 1.397 | 1.269 | 23.62 | 10.00 | 24.411 | pCi/L | 116.2348 | NO |
| 2 | B14-02771-05 | 120 | 1.282 | 1.269 | 23.52 | 10.00 | 2.490 | pCi/L | 116.729 | NO |
| 3 | B14-02771-06 | 120 | 1.449 | 1.269 | 23.87 | 10.00 | 33.968 | pCi/L | 115.0175 | NO |
| 4 | B14-02771-07 | 120 | 1.293 | 1.269 | 23.7 | 10.00 | 4.562 | pCi/L | 115.8425 | NO |
| 5 | B14-02771-08 | 120 | 1.254 | 1.269 | 23.51 | 10.00 | -2.874 | pCi/L | 116.7787 | NO |
| 6 | B14-02771-09 | 120 | 1.277 | 1.269 | 23.6 | 10.00 | 1.527 | pCi/L | 116.3333 | NO |
| 7 | B14-02771-10 | 120 | 1.140 | 1.269 | 23.48 | 10.00 | -24.748 | pCi/L | 116.9279 | NO |
| 8 | B14-02771-11 | 120 | 1.420 | 1.269 | 23.56 | 10.00 | 28.870 | pCi/L | 116.5309 | NO |
| 9 | B14-02771-12 | 120 | 9.004 | 1.269 | 23.59 | 10.00 | 1476.996 | pCi/L | 116.3827 | YES, analyze by LSC-A-001. |
| 10 | B14-02771-13 | 120 | 1.168 | 1.269 | 23.13 | 10.00 | -19.669 | pCi/L | 118.6972 | NO |
| 11 | B14-02771-14 | 120 | 1.321 | 1.269 | 23.41 | 10.00 | 10.006 | pCi/L | 117.2775 | NO |
| 12 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 13 | B14-02771-12-Rerun | 120 | 1.276 | 1.128 | 23.16 | 10.00 | 28.785 | pCi/L | 112.0151 | NO |
| 14 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 15 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 16 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 17 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 18 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 19 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 20 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 21 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 22 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 23 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |

Run all samples
by LSC-A-022 SDW
11-6-14

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-02771**

| **Method** | **ARS-054** | **Analysis** | **LSC-A-021** | **Matrix** | **AQ** |
|---|---|---|---|---|---|
| **Description** | **Low Level Tritium Screening** | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02771-01 | LCS | | | | | | | | | |
| ARS1-B14-02771-02 | LCSD | | | | | | | | | |
| ARS1-B14-02771-03 | MBL | | | | | | | | | |
| ARS1-B14-02771-04 | TRG | | | | **ARS1-14-02964** | 001 | 1 | CAMO-14-87134 | STD | 11/24/14 |
| ARS1-B14-02771-05 | TRG | | | | **ARS1-14-02964** | 002 | 1 | CAMO-14-87137 | STD | 11/24/14 |
| ARS1-B14-02771-06 | TRG | | | | **ARS1-14-02965** | 001 | 1 | CAPA-14-89328 | STD | 11/24/14 |
| ARS1-B14-02771-07 | TRG | | | | **ARS1-14-02966** | 001 | 1 | CAPA-14-87190 | STD | 11/24/14 |
| ARS1-B14-02771-08 | TRG | | | | **ARS1-14-02966** | 002 | 1 | CAPA-14-87192 | STD | 11/24/14 |
| ARS1-B14-02771-09 | TRG | | | | **ARS1-14-02966** | 003 | 1 | CAPA-14-87194 | STD | 11/24/14 |
| ARS1-B14-02771-10 | TRG | | | | **ARS1-14-02966** | 004 | 1 | CAPA-14-87195 | STD | 11/24/14 |
| ARS1-B14-02771-11 | TRG | | | | **ARS1-14-02966** | 005 | 1 | CAPA-14-87200 | STD | 11/24/14 |
| ARS1-B14-02771-12 | TRG | | | | **ARS1-14-02966** | 006 | 1 | CAPA-14-87201 | STD | 11/24/14 |
| ARS1-B14-02771-13 | TRG | | | | **ARS1-14-02999** | 001 | 1 | CAWR-14-89231 | STD | 11/26/14 |
| ARS1-B14-02771-14 | TRG | | | | **ARS1-14-03000** | 001 | 1 | CAPA-14-87186 | STD | 11/26/14 |

# ARS-054



| ID_31001_054 | ABatch | ABatchSampleID | ClientID | Aliquot1 | AliquotUnits1 | IC_ID1 | Aliquot2 | AliquotUnits2 | IC_ID2 | UserID | ModDate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14217 | ARS1-B14-02771 | ARS1-B14-02771-01 | | 1 | L | | | | | AMRAD\JBYRD | 11/03/2014 16:08:06 |
| 14218 | ARS1-B14-02771 | ARS1-B14-02771-02 | | 1 | L | | | | | AMRAD\JBYRD | 11/03/2014 16:08:06 |
| 14219 | ARS1-B14-02771 | ARS1-B14-02771-03 | | 1 | L | | | | | AMRAD\JBYRD | 11/03/2014 16:08:06 |
| 14220 | ARS1-B14-02771 | ARS1-B14-02771-04 | CAMO-14-87134 | 10 | L | 180072 | | | | AMRAD\JBYRD | 11/03/2014 16:08:06 |
| 14221 | ARS1-B14-02771 | ARS1-B14-02771-05 | CAMO-14-87137 | 10 | L | 180073 | | | | AMRAD\JBYRD | 11/03/2014 16:08:06 |
| 14222 | ARS1-B14-02771 | ARS1-B14-02771-06 | CAPA-14-89328 | 10 | L | 180074 | | | | AMRAD\JBYRD | 11/03/2014 16:08:06 |
| 14223 | ARS1-B14-02771 | ARS1-B14-02771-07 | CAPA-14-87190 | 10 | L | 180075 | | | | AMRAD\JBYRD | 11/03/2014 16:08:07 |
| 14224 | ARS1-B14-02771 | ARS1-B14-02771-08 | CAPA-14-87192 | 10 | L | 180076 | | | | AMRAD\JBYRD | 11/03/2014 16:08:07 |
| 14225 | ARS1-B14-02771 | ARS1-B14-02771-09 | CAPA-14-87194 | 10 | L | 180077 | | | | AMRAD\JBYRD | 11/03/2014 16:08:08 |
| 14226 | ARS1-B14-02771 | ARS1-B14-02771-10 | CAPA-14-87195 | 10 | L | 180078 | | | | AMRAD\JBYRD | 11/03/2014 16:08:08 |
| 14227 | ARS1-B14-02771 | ARS1-B14-02771-11 | CAPA-14-87200 | 10 | L | 180079 | | | | AMRAD\JBYRD | 11/03/2014 16:08:08 |
| 14228 | ARS1-B14-02771 | ARS1-B14-02771-12 | CAPA-14-87201 | 10 | L | 180081 | | | | AMRAD\JBYRD | 11/03/2014 16:08:09 |
| 14229 | ARS1-B14-02771 | ARS1-B14-02771-13 | CAWR-14-89231 | 10 | L | 180082 | | | | AMRAD\JBYRD | 11/03/2014 16:08:09 |
| 14230 | ARS1-B14-02771 | ARS1-B14-02771-14 | CAPA-14-87186 | 10 | L | 180083 | | | | AMRAD\JBYRD | 11/03/2014 16:08:09 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141103_1824
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141103_1824\20141103_1824.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141103_1824\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141103_1824\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 120.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

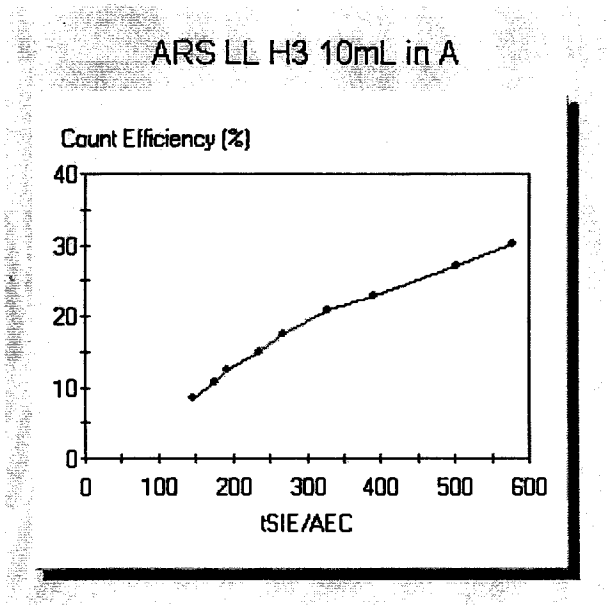
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 1 | BACKGROUND | 1.269 | 5.61 | 380.70 | 22.62 | 120.00 | 11/3/2014 | 6:33:09 PM | |
| 10 | 2 | B14-02771-04 | 1.397 | 5.91 | 408.61 | 23.62 | 120.00 | 11/3/2014 | 8:43:05 PM | |
| 10 | 3 | B14-02771-05 | 1.282 | 5.45 | 405.83 | 23.52 | 120.00 | 11/3/2014 | 10:52:59 PM | |
| 10 | 4 | B14-02771-06 | 1.449 | 6.07 | 415.29 | 23.87 | 120.00 | 11/4/2014 | 1:02:54 AM | |
| 10 | 5 | B14-02771-07 | 1.293 | 5.45 | 410.64 | 23.70 | 120.00 | 11/4/2014 | 3:12:48 AM | |
| 10 | 6 | B14-02771-08 | 1.254 | 5.33 | 405.45 | 23.51 | 120.00 | 11/4/2014 | 5:22:54 AM | |
| 10 | 7 | B14-02771-09 | 1.277 | 5.41 | 408.01 | 23.60 | 120.00 | 11/4/2014 | 7:32:50 AM | |
| 10 | 8 | B14-02771-10 | 1.140 | 4.85 | 404.61 | 23.48 | 120.00 | 11/4/2014 | 9:42:46 AM | |
| 10 | 9 | B14-02771-11 | 1.420 | 6.02 | 406.87 | 23.56 | 120.00 | 11/4/2014 | 11:52:43 AM | |
| 10 | 10 | B14-02771-12 | 9.004 | 38.16 | 407.78 | 23.59 | 120.00 | 11/4/2014 | 2:02:38 PM | |
| 10 | 11 | B14-02771-13 | 1.168 | 5.05 | 395.08 | 23.13 | 120.00 | 11/4/2014 | 4:12:29 PM | |
| 10 | 12 | B14-02771-14 | 1.321 | 5.64 | 402.71 | 23.41 | 120.00 | 11/4/2014 | 6:22:18 PM | |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141105_1547
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141105_1547\20141105_1547.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141105_1547\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141105_1547\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 120.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

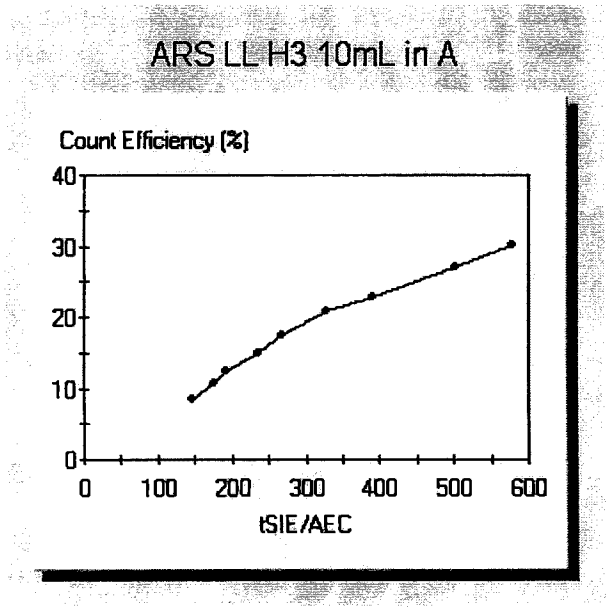
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 1 | BACKGROUND | 1.128 | 5.11 | 364.99 | 22.07 | 120.00 | 11/5/2014 | 3:55:52 PM | |
| 10 | 2 | B14-02771-12 | 1.276 | 5.51 | 395.94 | 23.16 | 120.00 | 11/5/2014 | 6:05:48 PM | |

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 10-29-14 | 1732 | SNC 16 | QA | QA | [illegible] |
| 11-3-14 | 16:40 | SNC 16 | QA | QA | [illegible] |
| ↓ | ↓ | Background | B14-02771 | 1824 | [illegible] |
| ↓ | ↓ | B14-02771-04 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -09 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -10 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -11 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -12 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -13 | ↓ | ↓ | [illegible] |
| ↓ | ↓ | ↓ -14 | ↓ | ↓ | [illegible] |
| | | | | | |
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| | | | | | |

SDR 12-30-14



Date: _____

Reviewed By: SDR Initials Date: 12-30-14

## *Low Level Tritium pH Checks*

| SDG# | Fraction | pH | Date | Analyst |
|---|---|---|---|---|
| ARS1-14-02964 | 001 | 7 | 11-3-14 | JB |
| ↓ | 002 | 7 | ↓ | JB |
| ARS1-14-02965 | 001 | 7 | ↓ | JB |
| ARS1-14-02966 | 001 | 7 | ↓ | JB |
| ↓ | 002 | 7 | ↓ | JB |
| ↓ | 003 | 7 | ↓ | JB |
| ↓ | 004 | 7 | ↓ | JB |
| ↓ | 005 | 7 | ↓ | JB |
| ↓ | 006 | 7 | ↓ | JB |
| ARS1-14-02999 | 001 | 7 | ↓ | JB |
| ARS1-14-03000 | 001 | 7 | ↓ | JB |
| | | JB 11-3-14 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | SLh 12-30-14 | | |
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| | | | | |
| | | | | |

*ARS-040-001.r0*

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

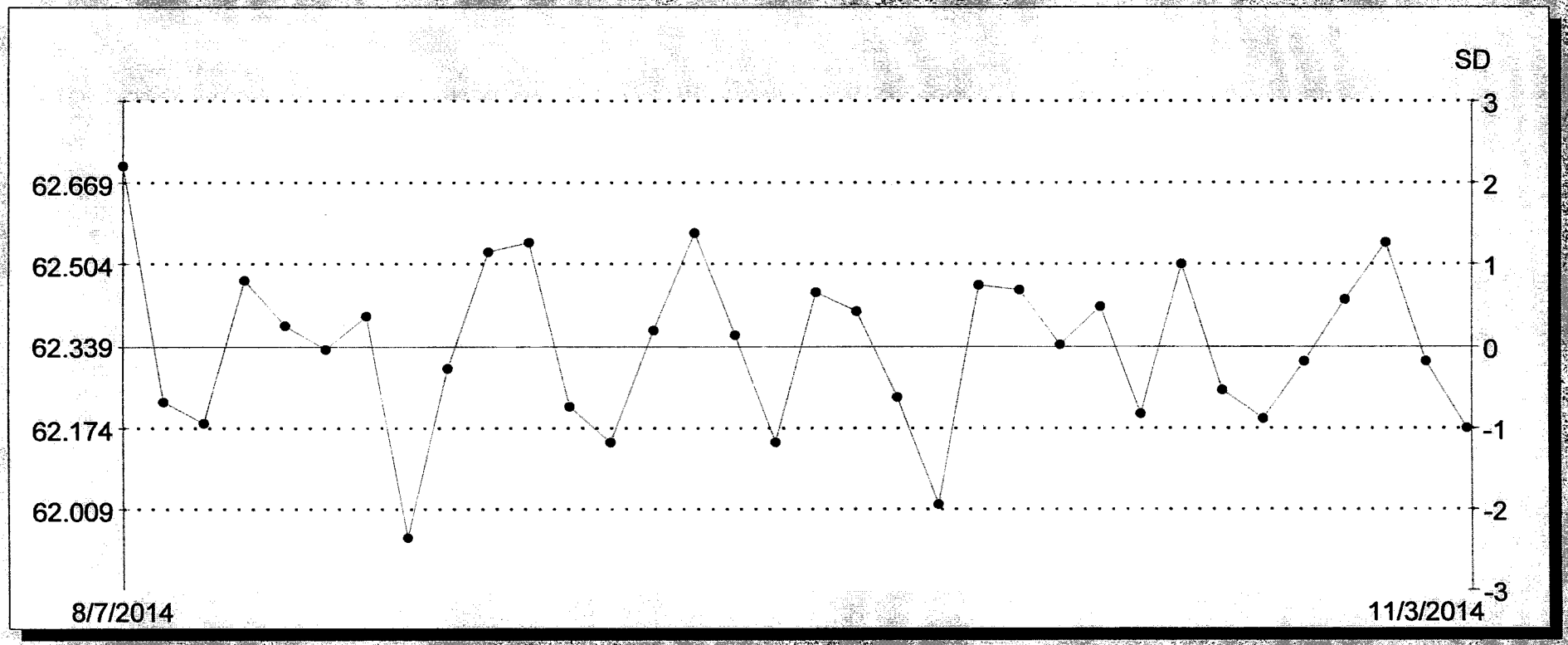
# Tritium-Screening by Low Level Liquid Scintillation Counting

# Control Charts

3H Efficiency
Total # pts : 5935
Valid # pts : 34
Mean : 62.34
SD : 0.16

| Date | Value | Valid Pt |
|---|---|---|
| Aug 07, 2014 | 62.70 | X |
| Aug 08, 2014 | 62.22 | X |
| Aug 11, 2014 | 62.18 | X |
| Aug 14, 2014 | 62.47 | X |
| Aug 15, 2014 | 62.38 | X |
| Aug 19, 2014 | 62.33 | X |
| Aug 20, 2014 | 62.40 | X |
| Aug 22, 2014 | 61.95 | X |
| Aug 29, 2014 | 62.29 | X |
| Sep 04, 2014 | 62.53 | X |
| Sep 05, 2014 | 62.55 | X |
| Sep 08, 2014 | 62.22 | X |
| Sep 12, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.37 | X |
| Sep 14, 2014 | 62.57 | X |
| Sep 14, 2014 | 62.36 | X |
| Sep 14, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.45 | X |
| Sep 17, 2014 | 62.41 | X |
| Sep 18, 2014 | 62.23 | X |
| Sep 26, 2014 | 62.02 | X |
| Sep 28, 2014 | 62.46 | X |
| Oct 01, 2014 | 62.45 | X |
| Oct 02, 2014 | 62.34 | X |
| Oct 05, 2014 | 62.42 | X |
| Oct 07, 2014 | 62.20 | X |
| Oct 13, 2014 | 62.50 | X |
| Oct 21, 2014 | 62.25 | X |
| Oct 24, 2014 | 62.19 | X |
| Oct 27, 2014 | 62.31 | X |
| Oct 28, 2014 | 62.43 | X |
| Oct 29, 2014 | 62.55 | X |
| Oct 29, 2014 | 62.30 | X |
| Nov 03, 2014 | 62.17 | X |

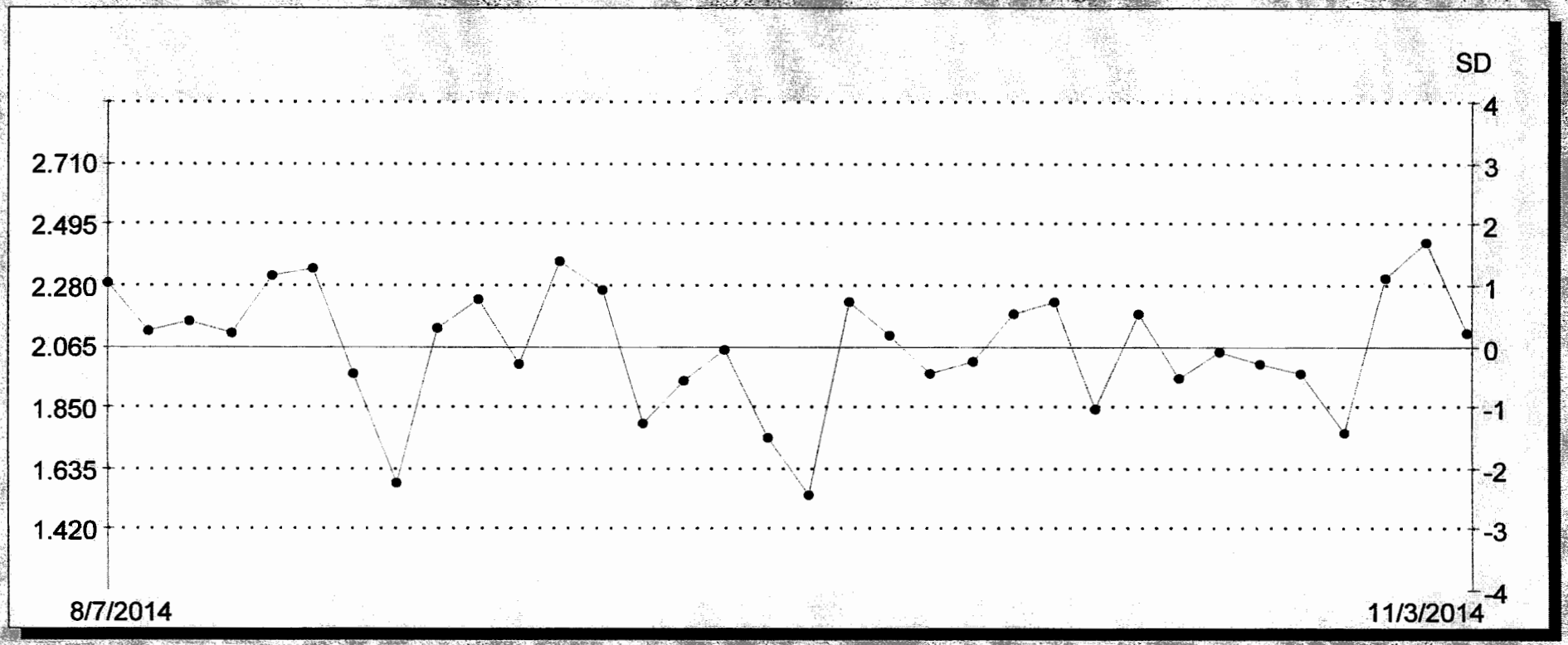
3H Efficiency
Total # pts : 5935
Valid # pts : 34
Mean : 62.34
SD : 0.16



3H Background
Total # pts : 5860
Valid # pts : 34
Mean : 2.06
SD : 0.21

| Date | Value | Valid Pt |
|---|---|---|
| Aug 07, 2014 | 2.29 | X |
| Aug 08, 2014 | 2.12 | X |
| Aug 11, 2014 | 2.15 | X |
| Aug 14, 2014 | 2.11 | X |
| Aug 15, 2014 | 2.31 | X |
| Aug 19, 2014 | 2.33 | X |
| Aug 20, 2014 | 1.97 | X |
| Aug 22, 2014 | 1.58 | X |
| Aug 29, 2014 | 2.13 | X |
| Sep 04, 2014 | 2.22 | X |
| Sep 05, 2014 | 2.00 | X |
| Sep 08, 2014 | 2.36 | X |
| Sep 12, 2014 | 2.26 | X |
| Sep 14, 2014 | 1.79 | X |
| Sep 14, 2014 | 1.95 | X |
| Sep 14, 2014 | 2.05 | X |
| Sep 14, 2014 | 1.74 | X |
| Sep 14, 2014 | 1.54 | X |
| Sep 17, 2014 | 2.21 | X |
| Sep 18, 2014 | 2.10 | X |
| Sep 26, 2014 | 1.97 | X |
| Sep 28, 2014 | 2.01 | X |
| Oct 01, 2014 | 2.17 | X |
| Oct 02, 2014 | 2.22 | X |
| Oct 05, 2014 | 1.84 | X |
| Oct 07, 2014 | 2.17 | X |
| Oct 13, 2014 | 1.95 | X |
| Oct 21, 2014 | 2.04 | X |
| Oct 24, 2014 | 2.00 | X |
| Oct 27, 2014 | 1.97 | X |
| Oct 28, 2014 | 1.75 | X |
| Oct 29, 2014 | 2.30 | X |
| Oct 29, 2014 | 2.43 | X |
| Nov 03, 2014 | 2.11 | X |

3H Background
Total # pts : 5860
Valid # pts : 34
Mean : 2.06
SD : 0.21



INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Low Level Liquid Scintillation Counting

# Calibration Information

ARS INTERNATIONAL

QUALITY CONTROL PROGRAM

AMERICAN RADIATION SERVICES
RADIOACTIVE REFERENCE SOLUTIONS

# ANNUAL ACTIVITY VERIFICATION

VERIFICATION DATE 1/7/2014 3:43 *date counted*
STANDARD REFERENCE # S-0289

| Principal Radionuclide | | Half Life, Years | | Half Life, Days |
|---|---|---|---|---|
| H-3 | *ENTER -->* | | *OR -->* | 4.4998E+03 |
| | | 1.232E+01 | | 4.4998E+03 |

Radionuclide H-3 Dilution Reference Date 1/3/2014 13:25

Dilution Activity 2.66 pCi per gram ===> dpm/g 5.91
Verif. Date Decay Corrected 2.66 pCi per gram ===> dpm/g 5.90

*Minimum of 3 Required*

| Trial ID | Sample Counts | Count Time (min) | Detector | Efficiency | Bkg. (cpm) | Net Weight | Decay Corrected Activity Result (dpm/g) | Decay Corrected Activity Result (pCi/g) |
|---|---|---|---|---|---|---|---|---|
| S-0289-V1 | 21.75 | 1 | LSC | 0.3549 | 10.54 | 5.019 | 6.29 | 2.83 |
| S-0289-V2 | 20.53 | 1 | LSC | 0.3546 | 10.54 | 4.993 | 5.64 | 2.54 |
| S-0289-V3 | 20.60 | 1 | LSC | 0.3546 | 10.54 | 4.996 | 5.68 | 2.56 |
| S-0289-V4 | 21.00 | 1 | LSC | 0.3547 | 10.54 | 5.005 | 5.89 | 2.65 |
| S-0289-V5 | 21.18 | 1 | LSC | 0.3542 | 10.54 | 4.993 | 6.02 | 2.71 |

| | | | |
|---|---|---|---|
| | Average | 5.90 | 2.66 |
| | Two Sigma Uncertainty | 0.52 | 0.24 |
| *10% Max* *PASS* | Standard Deviation percent of known concentration | 4.51% | 4.51% |
| | Target Activity | 5.90 | 2.66 |
| *5% Max* *PASS* | % Diff | 0.00% | 0.00% |

Verification Expiration Date: January 7, 2015

Prepared & Counted By [signature] Date: 1/7/2014 3:43

Verified & Approved By [signature] Date: 1-8-14

QC Approval [signature] Date: 1-8-14

S-0289
H-3
SL
Manufactuer NIST SRM 4927F
Sol Matrix H2O
Ref No NIST SRM 4927F
Tech Unknown
Parent ID S-0237
Verified 1/7/14
Expires 1/7/15
ARS INTERNATIONAL
RADIOACTIVE STANDARDS - BATON ROUGE LABORATORY

Assay Definition-

Assay Description:
H3 Normal Lvl

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\20140106_1733.results
RTF File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\H3 Normal Lvl2.lsa

Count Conditions-

Nuclide: Standard H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: PE UG STD H3
Count Time (min): 120.00
Count Mode: Normal
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: n/a
Colored Samples: Off Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

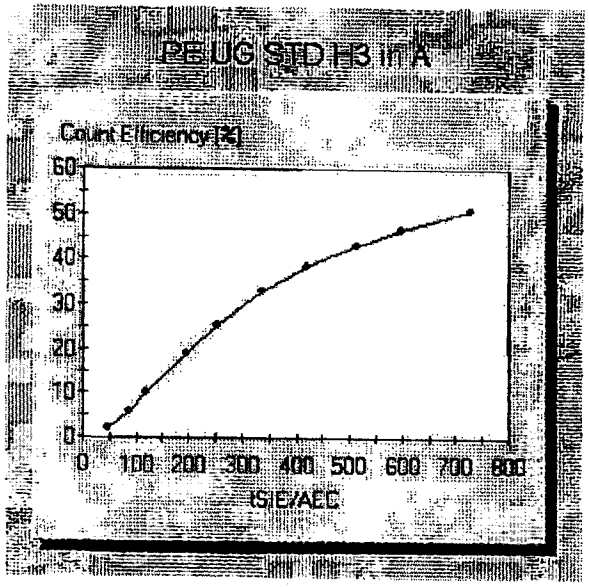
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 05/30/2013
Date Modified:
PE UG STD H3 in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 726.67 | 50.69 |
| 595.82 | 46.27 |
| 512.39 | 42.97 |
| 421.70 | 38.56 |
| 337.18 | 32.90 |
| 253.25 | 25.44 |
| 195.24 | 19.09 |
| 120.68 | 10.06 |
| 85.94 | 5.83 |
| 47.95 | 1.96 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | BACKGROUND | 10.54 | 29.70 | 375.63 | 35.48 | 120.00 | 1/6/2014 | 5:34:01 PM | |
| 20 | 2 | S-0289-V1 | 21.75 | 61.30 | 375.79 | 35.49 | 120.00 | 1/6/2014 | 7:35:52 PM | |
| 20 | 3 | S-0289-V2 | 20.53 | 57.89 | 375.34 | 35.46 | 120.00 | 1/6/2014 | 9:37:44 PM | |
| 20 | 4 | S-0289-V3 | 20.60 | 58.09 | 375.37 | 35.46 | 120.00 | 1/6/2014 | 11:39:36 PM | |
| 20 | 5 | S-0289-V4 | 21.00 | 59.21 | 375.58 | 35.47 | 120.00 | 1/7/2014 | 1:41:31 AM | |
| 20 | 6 | S-0289-V5 | 21.18 | 59.80 | 374.77 | 35.42 | 120.00 | 1/7/2014 | 3:43:23 AM | |

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

| Planning | |
|---|---|
| Planning Comments | Create an H-3 LCS standard |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.672651117 |
| Appx vol ml of Parent Sol'n | 3.679273813 |
| Expected Addition for Analysis g | 5 |

| Standards Preparation / Dilution | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 01/03/2013 13:25 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | 3.9375 |
| DPM Xferred on 01/03/2013 13:25 | 11703.25195 |
| Diluent/matrix | DI H2O |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.9 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | 2000 |
| Final Dilution Density (g/mL) | 0.99807 |
| Final Dilution Measured Mass g | 1996.14 |
| Comments | H3 LCS standard. Dilution performed as stated above by BSteffens on 1/3/13. BJS 1/3/13 |
| Final Dilution dpm/g | 5.908028472 |
| Final Dil New Ref Date/Time | 01/03/2013 13:25 |

## Parent Standard Data

| | | | |
|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | |
| Parent Solution # | S-0237 | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.3000000 |
| Parent Reference Date | 03/22/2010 10:10 | | |
| Parent Certified Act | 3503.682716 | Certl Act/Vol Units | dpm / g |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | |
| Parent Supplier | NIST SRM 4927F | | |
| Parent Date Recvd | 01/02/00 | | |
| Parent Received By | Unknown | | |
| Parent Cert Exp Date | | | |
| Parent Matrix | H2O | | |
| Certified dpm/g At Ref Date | 3503.682716 | | |
| Certified dpm/g on 01/03/2013 13:25 | 2995.111607 | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. BJS 3/22/10 | | |
| Parent Tech | Unknown | | |
| Is_Primary | FALSE | | |
| Is_LCS | TRUE | | |
| Is_Tracer | FALSE | | |
| Is_Calib | FALSE | | |

## H-3 Standard Verification

**Verifier's Name:** Brian Steffens **Date:** 1/6/2014

**Pipettor ID:** FJ40469
**Pipettor ID:** Auto-pipettor
**Pipettor ID:** na
**Standard ID:** S-0289
**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard |
|---|---|
| **S-0289-V1** | 5.019 g |
| **S-0289-V2** | 4.993 g |
| **S-0289-V3** | 4.996 g |
| **S-0289-V4** | 5.005 g |
| **S-0289-V5** | 4.993 g |
| | |
| | |
| | |
| | |
| | |

**Balance ID:** H1331122173560P

**H-3 Standard Verification**

**Verifier's Name:** Brian Steffens **Date:** 1-6-14

**Pipettor ID:** FJ40469

**Pipettor ID:** Auto-pipettor

**Pipettor ID:** na

**Standard ID:** S-0289

**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard | |
|---|---|---|
| S-0289-V1 | 5.019 | g |
| S-0289-V2 | 4.993 | g |
| S-0289-V3 | 4.996 | g |
| S-0289-V4 | 5.003 | g |
| S-0289-V5 | 4.993 | g |
| | | |
| | | |
| | | |
| | | |
| | | |

**Balance ID:** H1331122173560P

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

### Planning

| | |
|---|---|
| Planning Comments | |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.884999595 |
| Appx vol ml of Parent Sol'n | 3.892005204 |
| Expected Addition for Analysis g | |

### Standards Preparation / Dilution

| | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 1-3-13 1325 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | |
| DPM Xferred on 01/03/2014 11:01 | |
| Diluent/matrix | |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.90 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | |
| Final Dilution Density (g/mL) | |
| Final Dilution Measured Mass g | |
| Comments | |
| Final Dilution dpm/g | |
| Final Dil New Ref Date/Time | 01/03/2014 11:01 |

### Parent Standard Data

| | | | | | |
|---|---|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | | | |
| Parent Solution # | S-0237 | | | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.8000000 | | |
| Parent Reference Date | 03/22/2010 10:10 | | | | |
| Parent Certified Act | 3503.682716 | Certl Act/Vol Units | dpm | g | |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | | | |
| Parent Supplier | NIST SRM 4927F | | | | |
| Parent Date Recvd | 01/02/00 | | | | |
| Parent Received By | Unknown | | | | |
| Parent Cert Exp Date | | | | | |
| Parent Matrix | H2O | | | | |
| Certified dpm/g At Ref Date | 3503.682716 | | | | |
| Certified dpm/g on 01/03/2014 11:01 | 2831.403127 | | | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. BJS 3/22/10 | | | | |
| Parent Tech | Unknown | | | | |
| Is_Primary | FALSE | | | | |
| Is_LCS | TRUE | | | | |
| Is_Tracer | FALSE | | | | |
| Is_Calib | FALSE | | | | |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Folder Duplicate

# Report Compilation Checklist

ARS SDG: 14-02999 Client Name: LANL Sample Matrix: AQ

| LEVEL 1 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 1) Cover Page Complete and Accurate (see ARS-059)? | Yes No N/A | |
| 2) Technical Review Checklist(s) Complete and Accurate? | Yes No N/A | |
| 3) Case Narrative Complete and Accurate (see ARS-059)? | Yes No N/A | |
| 4) Form 1s Present for all Samples and Tests? | Yes No N/A | |
| 5) Client Specific Components are Present and Complete? | Yes No N/A | |

| LEVEL 2 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 6) Batch Quality Control Report is Present and Accurate? | Yes No N/A | |
| 7) DQO Report is Present and Accurate? | Yes No N/A | |
| 8) Client Specific Batch QC Components are Present and Complete? | Yes No N/A | |

| LEVEL 3 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 9) Efficiencies are Present? | Yes No N/A | |
| 10) Calibrations are Present? | Yes No N/A | |
| 11) Backgrounds are Present? | Yes No N/A | |
| 12) Spectrum Analysis is Present? | Yes No N/A | |
| 13) Spectral Plots are Present? | Yes No N/A | |
| 14) Plateaus are Present? | Yes No N/A | |
| 15) Control Charts are Present? | Yes No N/A | |
| 16) Other: | Yes No N/A | |

| LEVEL 4 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 17) Preparation Raw Data Present and Complete? | Yes No N/A | |
| 18) Instrument Raw Data Present and Complete? | Yes No N/A | |
| 19) Calibration Certificates Present? | Yes No N/A | |
| 20) Copies of Log Book Pages Present? | Yes No N/A | |
| 21) Sample Receiving Documentation Present? | Yes No N/A | |
| 22) LIMS Reports Present? | Yes No N/A | |
| 23) Applicable Correspondence Present? | Yes No N/A | |
| 24) Other: | Yes No N/A | |

Report Generator Signature 1-5-15 Date

James D. Pum 1-6-15
Management Review Signature Date

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-02999

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

| | | | |
|---|---|---|---|
| **ARS A. Batch ID(s):** | **Batch A:** B14-03174 | **Batch B:** NA | **Batch C:** NA |
| **Test Method(s):** | LSC-A-022 | NA | NA |

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| **1) 100% of Manual Transcriptions Verified?** | Yes No N/A | Yes No N/A |
| **2) 100% of Manual Calculations Verified?** | Yes No N/A | Yes No N/A |
| **3) Blank Composition/Configuration Matches Calibration?** | Yes No N/A | Yes No N/A |
| **4) Deviations from procedure are documented and verified?** | Yes No N/A | Yes No N/A |
| **5) Appropriate Cocktail Selected?** | Yes No N/A | Yes No N/A |

**6) Sample Prep Anomaly?** ☑ **No** ☐ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

| | | | |
|---|---|---|---|
| Jacob Ryd | 1-5-15 | [signature] | 1-5-15 |
| **Chemist Signature** | **Date** | **Verifier Review Signature** | **Date** |

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| **1) Calibrations Valid and Current?** | Yes No N/A | Yes No N/A |
| **2) Backgrounds Valid and Current?** | Yes No N/A | Yes No N/A |
| **3) Source Checks Completed and Acceptable?** | Yes No N/A | Yes No N/A |

James D. Pu 1-6-15
**QA Officer Signature** **Date**

| | Analyst Review | Technicial Review |
|---|---|---|
| **4) Background Checks Complete and Acceptable?** | Yes No N/A | Yes No N/A |
| **5) 100% of Manually Entered Parameters Verified Accurate?** | Yes No N/A | Yes No N/A |
| **6) Appropriate QC samples initiated at required frequency?** | Yes No N/A | Yes No N/A |
| **6) Test/Sample Specific Parameters** (See ARS-059 for details) | | |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

**7) Analysis Anomaly?** ☑ **No** ☐ **Yes** (See Comments) **NCR #** (If initiated): _____

| | | | |
|---|---|---|---|
| Jacob Ryd | 1-5-15 | [signature] | 1-5-15 |
| **Analyst Signature** | **Date** | **Technicial Reviewer Signature** | **Date** |

Batch A: B14-03174

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes ~~No~~ N/A | Yes (No) N/A |
| 2) RDL Criteria are Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 3) Method Blank Criterion Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 4) LCS/LCD Criteria Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 6) MS/MSD Criteria Met? | Yes No ~~N/A~~ | Yes No (N/A) |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

| Project Manager Signature | Date | QA Officer Signature | Date |
|---|---|---|---|
| SDL | 1-5-15 | James D. Lu | 1-6-15 |

## GENERAL COMMENTS

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-02999

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

**ARS A. Batch ID(s):** **Batch A:** B14-02771 **Batch B:** N/A **Batch C:** N/A

**Test Method(s):** LSC-A-022 N/A N/A

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| **1) 100% of Manual Transcriptions Verified?** | Yes No N/A | Yes No N/A |
| **2) 100% of Manual Calculations Verified?** | Yes No N/A | Yes No N/A |
| **3) Blank Composition/Configuration Matches Calibration?** | Yes No N/A | Yes No N/A |
| **4) Deviations from procedure are documented and verified?** | Yes No N/A | Yes No N/A |
| **5) Appropriate Cocktail Selected?** | Yes No N/A | Yes No N/A |

**6) Sample Prep Anomaly?** ☑ **No** ☐ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

Chemist Signature: [signature] Date: 11-3-14 Verifier Review Signature: [signature] Date: 11-3-14

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| **1) Calibrations Valid and Current?** | Yes No N/A | Yes No N/A |
| **2) Backgrounds Valid and Current?** | Yes No N/A | Yes No N/A |
| **3) Source Checks Completed and Acceptable?** | Yes No N/A | Yes No N/A |

QA Officer Signature: [signature] Date: 1-6-15

| | Analyst Review | Technicial Review |
|---|---|---|
| **4) Background Checks Complete and Acceptable?** | Yes No N/A | Yes No N/A |
| **5) 100% of Manually Entered Parameters Verified Accurate?** | Yes No N/A | Yes No N/A |
| **6) Appropriate QC samples initiated at required frequency?** | Yes No N/A | Yes No N/A |
| **6) Test/Sample Specific Parameters** (See ARS-059 for details) | | NA |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

**7) Analysis Anomaly?** ☑ **No** ☐ **Yes** (See Comments) **NCR #** (If initiated): _____

Analyst Signature: [signature] Date: 11-5-14 Technicial Reviewer Signature: NA Date

Batch A: B14-02771

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | ~~Yes~~ No N/A | Yes No N/A |
| 2) RDL Criteria are Met? | Yes ~~No~~ N/A | ~~Yes~~ No N/A |
| 3) Method Blank Criterion Met? | Yes No ~~N/A~~ | ~~Yes~~ No N/A |
| 4) LCS/LCD Criteria Met? | Yes No N/A | ~~Yes~~ No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | Yes No N/A | Yes ~~No~~ N/A |
| 6) MS/MSD Criteria Met? | Yes No N/A | Yes No ~~N/A~~ |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

| NA | NA |
|---|---|
| Project Manager Signature Date | QA Officer Signature Date |

## GENERAL COMMENTS

# DQO Report for SDG
ARS1-14-02999



| Analysis Code | Group | PrepType | Isotope | Activity Units | Aliquot Units | ProcedureNo | RDL | LCS_LL | LCS_UL | MS_LL | MS_UL | RadY_LL | RadY_UL | GravY_LL | GravY_LL | RER | RPD | DiltionReq | BlankCorrectionMDA | BlankCorrectionAll | CountTimeReq | AliquotRequired |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-021 | STD | WRAD | H-3 | pCi | L | ARS-054 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | |
| LSC-A-022 | STD | WRAD | Enriched H-3 | pCi | L | ARS-040 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | |

# SDG Report - Samples and Containers

**SDG Specific Data**

| | | | | | |
|---|---|---|---|---|---|
| SDG | ARS1-14-02999 | TAT Days | 28 | Project Type | Environmental |
| Sample Count | 1 Rpt Level 4 | Date Received | 11/3/2014 | COC Number | 2015-197 |
| Client | Los Alamos National Laboratory | Client Deadline | 12/1/2014 | PO Number | |
| Client Code | 114 | Internal Deadline | 11/28/2014 | Job Number | |
| Profile Number | PN-00094 | Lab Deadline | 11/26/2014 | Job Location | |
| Comments | | | | | |

**Samples and Containers (➔) Checked In Thus Far**

| FR | ClientID | Matrix | SampleStartDate | SampleEndDate | Disp | Hold | Arch | Storage | X | Units | Y | Units | Z | Units | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | CAWR-14-89231 | AQ | 10/29/14 10:00 AM | 10/29/14 10:00 AM | H | 90 | 5 | M5 | | | | | | | |
| ➔ | IC_ID | Cnt | Volume_mL | Wt_g | pH_Orig | pH_Final | CPM | uR_Hr | Storage | VOA | Head Sp | AF Units | AF Rate | AF Mins | AF Total Vol |
| | 179968 | 1 | 1000.00 | | | | 80 | 26 | | N | N/A | | | | |

# SDG Report - Analysis Assignments

| | | | |
|---|---|---|---|
| Temp SDG | ARS1-14-02999 | Sample Count | 1 |
| Client | Los Alamos National Laboratory | Analysis Count | 2-2 |

**Samples Count Totals per Analysis**

| Analysis Code | Analysis Description | Samples Count |
|---|---|---|
| LSC-A-021 | Low Level Tritium Screen in (Aqueous) | 1 |
| LSC-A-022 | Low Level Tritium by Enrichment Process in (Aqueous [AQ]) | 1 |

**Analyses Assigned Per Fraction**

| Fraction | Analysis Code | X = Assigned |
|---|---|---|
| 001 | LSC-A-021 | X |
| 001 | LSC-A-022 | X |

# ARS FILE TRACKING SHEET

**SDG:** ARS1-14-02999

| Task | Date / Time | Initials |
|---|---|---|
| Date & Time Samples Received | 11-03-14 08:10 | JRN |
| ICOC Initiated/Storage Location: M5 | 11-03-14 08:23 | JRN |
| Technical Checks Performed | See Batch | |
| Report Written / EDD Generated 1-5-15/1114/SDL | 1-5-15/1629 | SDL |
| Quality Assurance Checks Performed on Report | 1-6-15 0755 | JDS |
| Management Checks Performed on Report | | |
| *Preliminary Report Scan* | | |
| Report E-mailed/Faxed | | |
| Invoice Completed Invoice #: | | |
| Requires Report Mailed Yes / ~~No~~ | | |
| Requires Original COC mailed Yes / ~~No~~ | | |
| Report Reviewed and Imaged | | |

EDD Loaded 1-5-15 SDL

## SPECIAL REQUIREMENTS

| Requirement | Yes | No |
|---|---|---|
| 3 Hour Rush | ☐ | ☑ |
| 24 Hour Rush | ☐ | ☑ |
| 48 Hour Rush | ☐ | ☑ |
| 3 Day Rush | ☐ | ☑ |
| 5 Day Rush | ☐ | ☑ |
| 10 Day Rush | ☐ | ☑ |
| Standard Oil/Gas Client (5 Day) | ☐ | ☑ |
| Standard Turnaround | ☑ | ☐ |

**NOTES**

Jel

ARS-062-005 r6

**COMPANY NAME:** LANL **SDG:** ARSI-14-02999

**SHIPPING CONTAINER**

| | | |
|---|---|---|
| Good Condition | ✓ Yes | No |
| Radioactive | Yes | ✓ No |
| UN2910 | Yes | ✓ No |
| Sec. Seals | Yes | ✓ No |
| Seals Intact | Yes | No ✓ N/A |
| Air Bill | Yes | ✓ No |

**COC PRESENT WITH SAMPLES**

| | | |
|---|---|---|
| COC | ✓ Yes | No |

**SAMPLE CONTAINER(S)**

| | | |
|---|---|---|
| Good Condition | ✓ Yes | No |
| Sec. Seals | Yes | ✓ No |
| Seal Intact | Yes | No ✓ N/A |
| Marked Radioactive | Yes | ✓ No |

# Samples Rcv 1

Matrix [ AF . AQ . BI . FE . LT . SI . SO . UR . VG ]

**External and Internal Surveys**

| | | | | | |
|---|---|---|---|---|---|
| Exposure Rate Meter | M3 242861 | Serial No. | PR 264266 | Calibration Due Date | 4/16/15 |
| Count Rate Meter | M2 154859 | Serial No. | PR 184559 | Calibration Due Date | 4/16/15 |

| | | | | |
|---|---|---|---|---|
| Background Exposure Rate (µR/hr) | 24 | Max Exposure Rate on Shipping Containers Externals (Plus Bkgd) | 28 | µR/hr |
| Background Count Rate (cpm) | 70 | Max Removable Count Rate on Shipping Containers Externals (Plus Bkgd) | 80 | cpm |
| | | Max Removable Count Rate on Shipping Containers Internals (Plus Bkgd) | 80 | cpm |

| Sample Label/Comments/Notes | pH Orig (pH < 2 is Acceptable) | pH Final | Mark if Preserve | Acid Lot # | Weight(g) / Volume(mL) | µR/hr (Acceptance Limits <500 µR/hr) | cpm (Acceptance Limits <100 cpm/cm²) |
|---|---|---|---|---|---|---|---|
| LAWR-14-89231 | | | ☐ | | 1000 | 26 | 80 |
| | | | ☐ | JRN 11-3-14 | | | |
| | | | ☐ | | | | |
| | | | ☐ | | | | |
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| | | | ☐ | | | | |

Surveyors' Name: [signature] Date/Time Surveyed: 11-3-14 0810

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-197



**Client Contact:**

**Lab Agreement #:** 63641-001-10

**Project Number:**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-89231 | Oct 29 2014 | 10:00 | W | 1 |

**Special Instructions:**

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Nicholas Martinez | 10/30/14 3:00 | | Ryan Newman | 11-3-14 0810 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

83018

Shealy Labs
106 Vantage Point Drive
West Columbia SC 19172
803-227-3150

# Chain of Custody/Analysis Request AOEP

COC/Lab Request #: 2015-200



Client Contact:

Lab Agreement # :

Project Number :

Site Name: Los Alamos National Laboratory

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-8260B | WSP-LL-8260B-TB | WSP-LL-8270C |
|---|---|---|---|---|---|---|
| CAWR-14-89229 | Oct 30 2014 | 13:40 | W | 2 | | 2 |
| CAWR-14-89222 | Oct 30 2014 | 13:40 | W | 2 | | 2 |
| CAWR-14-89225 | Oct 30 2014 | 13:40 | W | | 1 | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| Sherri Sherwood | Sherri Sherwood | 11/3/14 3pm | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89222

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Sacred Spring | | | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | FD | |
| PORT: | | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS 10/30/14 | 1 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS 10/30/14 | 1 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS 10/30/14 | 1 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS 10/30/14 | 1 | ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89222 **WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

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**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/30/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Stocker, A. Tosh & D. Saavedra

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stocker | 10/30/14 1605 | D. Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89225 **WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | BC |
| LOCATION ID: Sacred Spring | | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FTB | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | QC | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| AB | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | NA |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS BS 10/30/14 | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ HCL BS 10/30/14 | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/30/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Toth + D. Fernandez

| RELINQUISHED BY | Date/Time | RECEIVED BY | Date/Time |
|---|---|---|---|
| (Printed Name) Andrew Stoke<br>(Signature) | 10/30/14 1605 | (Printed Name) S. Sherwood<br>(Signature) S. Sherwood | 10/30/14 1605 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89229

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| **DATE COLLECTED (MM/DD/YYYY):** | | 10/30/2014 | **FIELD MATRIX:** | WG | ok |
| **TIME COLLECTED (HH:MM):** | | 1340 | **MEDIA:** | UA | |
| **PRS ID:** | | ok | **SAMPLE TECH CODE:** | UA | PP |
| **LOCATION ID:** | Sacred Spring | | **FIELD PREP:** | UF | ok |
| **LOCATION TYPE:** | SPR | | **FIELD QC TYPE:** | REG | |
| **PORT:** | | | **SAMPLE USAGE:** | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS MS 10/30/14 | 2 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS MS 10/30/14 | 2 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89229 **WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

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**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 3.70 mg/L Flow (in gpm) 4.49 GPM Oxidation-Reduction Potential NA mV

pH 7.33 SU Specific Conductance 365 uS/cm Temperature 12.94 deg C

Turbidity 10.9 NTU

**COLLECTED BY (PRINT)** A. Toth + D. Jaramillo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrea Stacker | 10/30/14 1605 | Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 10/08/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-200

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| PK04016 | SW-846:8260B | 1 | 1 | 1 | | |
| PK04016 | SW-846:8270D | 1 | 1 | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PK04016 | SW-846:8260B | 60293 | NA | 1 | | | | | 1 | | | | | 1 | | | | | | | |
| PK04016 | SW-846:8260B | 60351 | NA | | 1 | 1 | | | 1 | | | | | 1 | | | | | | | |
| PK04016 | SW-846:8270D | 60550 | 60168 | 1 | 1 | | | | 1 | | | | | 1 | | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8260B | VOC | null | PQ60293-001 | MB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | null | PQ60293-002 | LCS | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | null | PQ60351-001 | MB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | null | PQ60351-002 | LCS | 0 | 3 | 5 | 0 |
| SW-846:8260B | VOC | CAWR-14-89222 | PK04016-002 | FD | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-89225 | PK04016-003 | FTB | 5 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-89229 | PK04016-001 | REG | 5 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | null | PQ60168-001 | MB | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | null | PQ60168-002 | LCS | 0 | 6 | 10 | 0 |
| SW-846:8270D | SVOC | CAWR-14-89222 | PK04016-002 | FD | 13 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-89229 | PK04016-001 | REG | 13 | 6 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

# DATA VALIDATION REPORT

No.

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

# DATA VALIDATION REPORT

13. Display Flagged Data.

None.

| Reason Code | Description |
|---|---|
| U_LAB | The analytical laboratory qualified the analyte as not detected. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8260B | 0 | 5 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8270D | 0 | 13 |
| CAWR-14-89225 | Sacred Spring | FTB | SW-846:8260B | 0 | 5 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8260B | 0 | 5 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8270D | 0 | 13 |

# Report of Analysis

Los Alamos National Lab
TA-3 SM-271 Drop Point O2U
Los Alamos, NM 87545
Attention: Keith Greene

Lot Number:PK04016

Date Completed:11/11/2014

Grant Wilton
Project Manager

This report shall not be reproduced, except in its entirety, without the written approval of Shealy Environmental Services, Inc.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

* P K 0 4 0 1 6 *

# Case Narrative
## Los Alamos National Lab
### Lot Number: PK04016

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

# Sample Summary

## Los Alamos National Lab

Lot Number: PK04016

| Sample Number | Sample ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| 001 | CAWR-14-89229 | Aqueous | 10/30/2014 1340 | 11/04/2014 |
| 002 | CAWR-14-89222 | Aqueous | 10/30/2014 1340 | 11/04/2014 |
| 003 | CAWR-14-89225 | Aqueous | 10/30/2014 1340 | 11/04/2014 |

(3 samples)

# Executive Summary

## Los Alamos National Lab

Lot Number: PK04016

| Sample | Sample ID | Matrix | Parameter | Method | Result | Q | Units | Page |
|---|---|---|---|---|---|---|---|---|

(0 detections)

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PK04016-001
Description: CAWR-14-89229
Matrix: Aqueous
Date Sampled: 10/30/2014 1340
Date Received: 11/04/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 11/07/2014 1409 | EH1 | | 60293 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 94 | 70-130 |
| Bromofluorobenzene | | 96 | 70-130 |
| Toluene-d8 | | 96 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PK04016-001
Description: CAWR-14-89229
Matrix: Aqueous
Date Sampled: 10/30/2014 1340
Date Received: 11/04/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 11/11/2014 0005 | DRB1 | 11/06/2014 1100 | 60168 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.0 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 25 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.0 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.0 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 25 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 25 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.0 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 101 | 41-144 |
| 2-Fluorobiphenyl | | 104 | 37-129 |
| 2-Fluorophenol | | 90 | 24-127 |
| Nitrobenzene-d5 | | 96 | 38-127 |
| Phenol-d5 | | 98 | 28-128 |
| Terphenyl-d14 | | 100 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PK04016-002
Description: CAWR-14-89222
Matrix: Aqueous
Date Sampled: 10/30/2014 1340
Date Received: 11/04/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 11/08/2014 1348 | EH1 | | 60351 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 94 | 70-130 |
| Bromofluorobenzene | | 94 | 70-130 |
| Toluene-d8 | | 96 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Semivolatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PK04016-002
Description: CAWR-14-89222
Matrix: Aqueous
Date Sampled: 10/30/2014 1340
Date Received: 11/04/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270D | 1 | 11/11/2014 0028 | DRB1 | 11/06/2014 1100 | 60168 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Atrazine | 1912-24-9 | 8270D | ND | | 5.0 | ug/L | 1 |
| Benzidine | 92-87-5 | 8270D | ND | | 25 | ug/L | 1 |
| bis(2-Chloroethyl)ether | 111-44-4 | 8270D | ND | | 5.0 | ug/L | 1 |
| bis(2-Chloroisopropyl)ether | 108-60-1 | 8270D | ND | | 5.0 | ug/L | 1 |
| 3,3'-Dichlorobenzidine | 91-94-1 | 8270D | ND | | 25 | ug/L | 1 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 8270D | ND | | 25 | ug/L | 1 |
| 1,2-Diphenylhydrazine(as azobenzene) | 103-33-3 | 8270D | ND | | 5.0 | ug/L | 1 |
| Hexachlorobenzene | 118-74-1 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitroso-di-butylamine | 924-16-3 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodiethylamine | 55-18-5 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodimethylamine | 62-75-9 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosodi-n-propylamine | 621-64-7 | 8270D | ND | | 5.0 | ug/L | 1 |
| N-Nitrosopyrrolidine | 930-55-2 | 8270D | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 98 | 41-144 |
| 2-Fluorobiphenyl | | 101 | 37-129 |
| 2-Fluorophenol | | 88 | 24-127 |
| Nitrobenzene-d5 | | 95 | 38-127 |
| Phenol-d5 | | 93 | 28-128 |
| Terphenyl-d14 | | 84 | 10-148 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# Volatile Organic Compounds by GC/MS

Client: Los Alamos National Lab
Laboratory ID: PK04016-003
Description: CAWR-14-89225
Matrix: Aqueous
Date Sampled: 10/30/2014 1340
Date Received: 11/04/2014

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260B | 1 | 11/08/2014 1409 | EH1 | | 60351 |

| Parameter | CAS Number | Analytical Method | Result | Q | PQL | Units | Run |
|---|---|---|---|---|---|---|---|
| Acrolein | 107-02-8 | 8260B | ND | | 50 | ug/L | 1 |
| Acrylonitrile | 107-13-1 | 8260B | ND | | 50 | ug/L | 1 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 126-99-8 | 8260B | ND | | 5.0 | ug/L | 1 |
| Methacrylonitrile | 126-98-7 | 8260B | ND | | 5.0 | ug/L | 1 |
| 1,2,3-Trichloropropane | 96-18-4 | 8260B | ND | | 5.0 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 94 | 70-130 |
| Bromofluorobenzene | | 94 | 70-130 |
| Toluene-d8 | | 96 | 70-130 |

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the PQL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

# QC Summary

# Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ60293-001
Batch: 60293
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| Acrolein | ND | | 1 | 50 | ug/L | 11/07/2014 1031 |
| Acrylonitrile | ND | | 1 | 50 | ug/L | 11/07/2014 1031 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | ND | | 1 | 5.0 | ug/L | 11/07/2014 1031 |
| Methacrylonitrile | ND | | 1 | 5.0 | ug/L | 11/07/2014 1031 |
| 1,2,3-Trichloropropane | ND | | 1 | 5.0 | ug/L | 11/07/2014 1031 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 96 | 70-130 |
| 1,2-Dichloroethane-d4 | | 94 | 70-130 |
| Toluene-d8 | | 98 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ60293-002
Batch: 60293
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 480 | | 1 | 95 | 60-140 | 11/07/2014 0948 |
| Acrylonitrile | 100 | 93 | | 1 | 93 | 70-130 | 11/07/2014 0948 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 47 | | 1 | 94 | 70-130 | 11/07/2014 0948 |
| Methacrylonitrile | 50 | 47 | | 1 | 94 | 70-130 | 11/07/2014 0948 |
| 1,2,3-Trichloropropane | 50 | 45 | | 1 | 91 | 70-130 | 11/07/2014 0948 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 95 | 70-130 |
| 1,2-Dichloroethane-d4 | | 96 | 70-130 |
| Toluene-d8 | | 96 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - MB

Sample ID: PQ60351-001
Batch: 60351
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| Acrolein | ND | | 1 | 50 | ug/L | 11/08/2014 1057 |
| Acrylonitrile | ND | | 1 | 50 | ug/L | 11/08/2014 1057 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | ND | | 1 | 5.0 | ug/L | 11/08/2014 1057 |
| Methacrylonitrile | ND | | 1 | 5.0 | ug/L | 11/08/2014 1057 |
| 1,2,3-Trichloropropane | ND | | 1 | 5.0 | ug/L | 11/08/2014 1057 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 95 | 70-130 |
| 1,2-Dichloroethane-d4 | | 93 | 70-130 |
| Toluene-d8 | | 98 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - LCS

Sample ID: PQ60351-002
Batch: 60351
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acrolein | 500 | 500 | | 1 | 100 | 60-140 | 11/08/2014 1015 |
| Acrylonitrile | 100 | 93 | | 1 | 93 | 70-130 | 11/08/2014 1015 |
| 2-Chloro-1,3-Butadiene (Chloroprene) | 50 | 49 | | 1 | 98 | 70-130 | 11/08/2014 1015 |
| Methacrylonitrile | 50 | 48 | | 1 | 96 | 70-130 | 11/08/2014 1015 |
| 1,2,3-Trichloropropane | 50 | 47 | | 1 | 95 | 70-130 | 11/08/2014 1015 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 95 | 70-130 |
| 1,2-Dichloroethane-d4 | | 94 | 70-130 |
| Toluene-d8 | | 97 | 70-130 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS - MB

Sample ID: PQ60168-001
Batch: 60168
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 11/06/2014 1100

| Parameter | Result | Q | Dil | PQL | Units | Analysis Date |
|---|---|---|---|---|---|---|
| 1,2-Diphenylhydrazine(as azobenzene) | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| 3,3'-Dichlorobenzidine | ND | | 1 | 25 | ug/L | 11/10/2014 2147 |
| 4,6-Dinitro-2-methylphenol | ND | | 1 | 25 | ug/L | 11/10/2014 2147 |
| Atrazine | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| Benzidine | ND | | 1 | 25 | ug/L | 11/10/2014 2147 |
| bis(2-Chloroethyl)ether | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| bis(2-Chloroisopropyl)ether | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| Hexachlorobenzene | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| N-Nitroso-di-butylamine | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| N-Nitrosodi-n-propylamine | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| N-Nitrosodiethylamine | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| N-Nitrosodimethylamine | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |
| N-Nitrosopyrrolidine | ND | | 1 | 5.0 | ug/L | 11/10/2014 2147 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 99 | 41-144 |
| 2-Fluorobiphenyl | | 109 | 37-129 |
| 2-Fluorophenol | | 97 | 24-127 |
| Nitrobenzene-d5 | | 101 | 38-127 |
| Phenol-d5 | | 104 | 28-128 |
| Terphenyl-d14 | | 112 | 10-148 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS - LCS

Sample ID: PQ60168-002
Batch: 60168
Analytical Method: 8270D

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 11/06/2014 1100

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,2-Diphenylhydrazine(as azobenzene) | 100 | 93 | | 1 | 93 | 51-116 | 11/10/2014 2210 |
| 3,3'-Dichlorobenzidine | 200 | 170 | | 1 | 85 | 53-118 | 11/10/2014 2210 |
| 4,6-Dinitro-2-methylphenol | 500 | 560 | | 1 | 113 | 46-134 | 11/10/2014 2210 |
| Atrazine | 100 | 83 | | 1 | 83 | 70-130 | 11/10/2014 2210 |
| Benzidine | 200 | 85 | | 1 | 43 | 10-115 | 11/10/2014 2210 |
| bis(2-Chloroethyl)ether | 100 | 94 | | 1 | 94 | 35-114 | 11/10/2014 2210 |
| bis(2-Chloroisopropyl)ether | 100 | 95 | | 1 | 95 | 34-110 | 11/10/2014 2210 |
| Hexachlorobenzene | 100 | 110 | | 1 | 110 | 49-128 | 11/10/2014 2210 |
| N-Nitrosodi-n-propylamine | 100 | 99 | | 1 | 99 | 39-119 | 11/10/2014 2210 |
| N-Nitrosodimethylamine | 100 | 92 | | 1 | 92 | 36-118 | 11/10/2014 2210 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 2,4,6-Tribromophenol | | 123 | 41-144 |
| 2-Fluorobiphenyl | | 108 | 37-129 |
| 2-Fluorophenol | | 96 | 24-127 |
| Nitrobenzene-d5 | | 101 | 38-127 |
| Phenol-d5 | | 104 | 28-128 |
| Terphenyl-d14 | | 117 | 10-148 |

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Shealy Labs
106 Vantage Point Drive
West Columbia SC 19172
803-227-3150

# Chain of Custody/Analysis Request

AOEP

PK04016

COC/Lab Request #: 2015-200

Page 1 of 1

Client Contact:

Lab Agreement # :

Project Number :

Site Name: Los Alamos National Laboratory

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-8260B | WSP-LL-8260B-TB | WSP-LL-8270C |
|---|---|---|---|---|---|---|
| CAWR-14-89229 | Oct 30 2014 | 13:40 | W | 2 | | 2 |
| CAWR-14-89222 | Oct 30 2014 | 13:40 | W | 2 | | 2 |
| CAWR-14-89225 | Oct 30 2014 | 13:40 | W | | 1 | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| Sherri Sherwood | Sherri Sherwood | 11/3/14 3pm | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| | | | | | |
| Relinquished by: FedEx | Print Name: | Date/Time: 11/4/14 0930 | Received by: | Print Name: Mariela Monge | Date/Time: 11/4/14 0930 |

T=5.1

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 15

Page 1 of 1
Replaces Date: 03/07/14
Effective Date: 07/15/14

# Sample Receipt Checklist (SRC)

Client: Los Almos Cooler Inspected by/date: MCM/11/04/14 Lot #: PK04016

| | | | |
|---|---|---|---|
| Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other | | | |
| Yes ☑ | No ☐ | | 1. Were custody seals present on the cooler? |
| Yes ☑ | No ☐ | NA ☐ | 2. If custody seals were present, were they intact and unbroken? |
| Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt: 11/4/14 MCM ~~4.7~~ 5.1 °C / / °C / / °C / / °C 0.0 MCM 11/4/14<br>Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: #3 IR Gun Correction Factor: ~~0.4~~ °C<br>Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None | | | |
| Yes ☐ | No ☐ | NA ☑ | 3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.) |
| Yes ☐ | No ☑ | NA ☐ | 4. Is the commercial courier's packing slip attached to this form? |
| Yes ☑ | No ☐ | | 5. Were proper custody procedures (relinquished/received) followed? |
| Yes ☐ | No ☑ | NA ☐ | 5a Were samples relinquished by client to commercial courier? |
| Yes ☑ | No ☐ | | 6. Were sample IDs listed on the COC? |
| Yes ☑ | No ☐ | | 7. Were sample IDs listed on all sample containers? |
| Yes ☑ | No ☐ | | 8. Was collection date & time listed on the COC? |
| Yes ☑ | No ☐ | | 9. Was collection date & time listed on all sample containers? |
| Yes ☑ | No ☐ | | 10. Did all container label information (ID, date, time) agree with the COC? |
| Yes ☑ | No ☐ | | 11. Were tests to be performed listed on the COC? |
| Yes ☑ | No ☐ | | 12. Did all samples arrive in the proper containers for each test? |
| Yes ☑ | No ☐ | | 13. Did all containers arrive in good condition (unbroken, lids on, etc.)? |
| Yes ☑ | No ☐ | | 14. Was adequate sample volume available? |
| Yes ☑ | No ☐ | | 15. Were all samples received within ½ the holding time or 48 hours, whichever comes first? |
| Yes ☐ | No ☑ | | 16. Were any samples containers missing? |
| Yes ☐ | No ☑ | | 17. Were there any excess samples not listed on COC? |
| Yes ☐ | No ☑ | NA ☐ | 18. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials? |
| Yes ☐ | No ☐ | NA ☑ | 19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2? |
| Yes ☐ | No ☐ | NA ☑ | 20. Were all cyanide and/or sulfide samples received at a pH >12? |
| Yes ☐ | No ☐ | NA ☑ | 21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine? |
| Yes ☐ | No ☐ | NA ☑ | 22. Were collection temperatures documented on the COC for NC samples? |
| Yes ☐ | No ☐ | NA ☑ | 23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS? |
| Yes ☐ | No ☑ | | 24. Was the quote number used taken from the container label? |
| **Sample Preservation** (Must be completed for any sample(s) incorrectly preserved or with headspace.) | | | |
| Sample(s)_____were received incorrectly preserved and were adjusted accordingly in sample receiving with _____($H_2SO_4$,$HNO_3$,HCl,NaOH) using SR # _____. | | | |
| Sample(s) _____were received with bubbles >6 mm in diameter. | | | |
| Sample(s) _____were received with TRC >0.2 mg/L (If #21 is No) | | | |
| SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____<br>Sample(s) _____ were not received at a pH of <2 and were adjusted accordingly using SR#_____ | | | |
| Sample labels applied by: MCM Verified by: MCM Date: 11/4/14 | | | |

Comments:
Sample 001 arrived w/ additional amber

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-207



Client Contact:

Lab Agreement # : 126310011

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8011-TB | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8151A-PCP | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89229 | Oct 30 2014 | 13:40 | W | 1 | 2 | | ~~2~~ 1 | 2 | 2 | 2 | ~~2~~ 1 | | 1 | | 1 | 2 | | 1 | 1 | | | | |
| CAWR-14-89222 | Oct 30 2014 | 13:40 | W | 1 | 2 | | ~~2~~ 1 | 2 | ~~2~~ 1 | ~~2~~ 1 | ~~2~~ 1 | | 1 | | 1 | ~~2~~ 1 | | 1 | 1 | | | | |
| CAWR-14-89223 | Oct 30 2014 | 13:40 | W | | | | | | | | | 1 | | 1 | | | 1 | | | | | | |
| CAWR-14-89225 | Oct 30 2014 | 13:40 | W | | | 1 | | ~~2~~ 1 | | | | | | | | | | | | | | | |
| CAWR-14-89236 | Oct 30 2014 | 13:40 | W | | | | | | | | | 1 | | 1 | | | 1 | | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| Sherri Sherwood | Sherri Sherwood | 11/3/14 3pm | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89222

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Sacred Spring | | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FD | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | QC | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS MS 10/30/14 | 1 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS MS 10/30/14 | 1 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS ↓ | 1 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS MS 10/30/14 | 1 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS MS 10/30/14 | 1 | ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89222

**WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

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**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/30/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Stocker, A. Toth + D. Jaramillo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Aidrian Stocker | 10/30/14 1605 | S. Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89223

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | pp |
| LOCATION ID: Sacred Spring | | | FIELD PREP: | F | ok |
| LOCATION TYPE: | | | FIELD QC TYPE: | FD | |
| PORT: | | | SAMPLE USAGE: | QC | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/30/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Tosh + D. Jeranillo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Tosh | 10/30/14 1605 | S. Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89225

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | DC |
| LOCATION ID: Sacred Spring | | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FTB | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | QC | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| AB | WSP-8011-TB | 40 ML SEPTUM GLASS | 1 | HCL | Y | NA |
| ↓ | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS 10/30/14 | 2 | HCL | ↓ | ↓ |
| ↓ | WSP-LL-8260B-TB | 40 ML SEPTUM GLASS | 1 | ~~ICE~~ HCL 10/30/14 | ↓ | ↓ |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/30/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Toth + D. Fraunfelter

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stokes | 10/30/14 1605 | S. Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89229

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Sacred Spring | | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: SPR | | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | ↓ | ↓ |
| | WSP-8082-PCB | 1 LITER AMBER GLASS MS 10/30/14 | 2 | ICE | ↓ | ↓ |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | ↓ | ↓ |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS MS 10/30/14 | 2 | ICE | ↓ | ↓ |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | ↓ | ↓ |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | ↓ | ↓ |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89229 **WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

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**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 3.70 mg/L Flow (in gpm) 4.49 GPM Oxidation-Reduction Potential NA mV

pH 7.33 SU Specific Conductance 365 uS/cm Temperature 12.94 deg C

Turbidity 10.9 NTU

**COLLECTED BY (PRINT)** A. Toth + D. Jaramillo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrea Stacker | 10/30/14 1605 | S. Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89236

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Sacred Spring | | | FIELD PREP: | F | ok |
| LOCATION TYPE: SPR | | | FIELD QC TYPE: | REG | |
| PORT: | | | SAMPLE USAGE: | INV | |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| xA | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | NA |
| | WSP-GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | | |
| | WSP-NH3+NO3/NO2+PO4 | 500 ML AMBER GLASS | 1 | H2SO4 | | |

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:** AS 10/30/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Tosh + D. Jaramillo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stocker | 10/30/14 1605 | S. Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |
| | | | |

Report Date 10/08/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-207

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| 360425 | EPA:120.1 | 1 | 1 | | | |
| 360425 | EPA:150.1 | 1 | 1 | | | |
| 360425 | EPA:160.1 | 1 | 1 | | | |
| 360425 | EPA:245.2 | 2 | 2 | | | |
| 360425 | EPA:300.0 | 1 | 1 | | | |
| 360425 | EPA:310.1 | 1 | 1 | | | |
| 360425 | EPA:335.4 | 1 | 1 | | | |
| 360425 | EPA:350.1 | 1 | 1 | | | |
| 360425 | EPA:351.2 | 1 | 1 | | | |
| 360425 | EPA:353.2 | 1 | 1 | | | |
| 360425 | EPA:365.4 | 1 | 1 | | | |
| 360425 | EPA:900 | 1 | 1 | | | |
| 360425 | EPA:901.1 | 1 | 1 | | | |
| 360425 | EPA:905.0 | 1 | 1 | | | |
| 360425 | HASL-300:AM-241 | 1 | 1 | | | |
| 360425 | HASL-300:ISOPU | 1 | 1 | | | |
| 360425 | HASL-300:ISOU | 1 | 1 | | | |
| 360425 | SM:A2340B | 1 | 1 | | | |
| 360425 | SW-846:6010C | 1 | 1 | | | |
| 360425 | SW-846:6020 | 1 | 1 | | | |
| 360425 | SW-846:6850 | 1 | 1 | | | |
| 360425 | SW-846:8011 | 1 | 1 | 1 | | |
| 360425 | SW-846:8082 | 1 | 1 | | | |
| 360425 | SW-846:8151A | 1 | 1 | | | |
| 360425 | SW-846:8260B | 1 | 1 | 1 | | |
| 360425 | SW-846:8270D | 1 | 1 | | | |
| 360425 | SW-846:8310 | 1 | 1 | | | |
| 360425 | SW-846:8321A_MOD | 1 | 1 | | | |
| 360425 | SW-846:9060 | 1 | 1 | | | |

# DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360425 | EPA:120.1 | 1436124 | 1436124 | 1 | 1 | | | | | | | | | 1 | | | | 1 | | | |
| 360425 | EPA:150.1 | 1433708 | 1433708 | 1 | 1 | | | | | | | | | 1 | | | | 2 | | | |
| 360425 | EPA:160.1 | 1433342 | 1433342 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360425 | EPA:245.2 | 1435631 | 1435624 | 2 | 2 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360425 | EPA:300.0 | 1436786 | 1436786 | 1 | 1 | | | | 1 | | | | | 1 | | | | 2 | | | |
| 360425 | EPA:310.1 | 1435239 | 1435239 | 1 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360425 | EPA:335.4 | 1432348 | 1432347 | 1 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360425 | EPA:350.1 | 1433995 | 1433994 | 1 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360425 | EPA:351.2 | 1431334 | 1431333 | 1 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360425 | EPA:353.2 | 1434006 | 1434006 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360425 | EPA:365.4 | 1433200 | 1433197 | 1 | 1 | | | | 1 | 2 | | | | 1 | | | | 2 | | | |
| 360425 | EPA:900 | 1433352 | 1433352 | 1 | 1 | | | | 1 | 1 | 1 | | | 1 | | | | 1 | | | |
| 360425 | EPA:901.1 | 1434033 | 1434033 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360425 | EPA:905.0 | 1434929 | 1434929 | 1 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360425 | HASL-300:AM-241 | 1437369 | 1437369 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360425 | HASL-300:ISOPU | 1437370 | 1437370 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360425 | HASL-300:ISOU | 1433419 | 1433419 | 1 | 1 | | | | 1 | | | | | 1 | | | | 1 | | | |
| 360425 | SM:A2340B | 1438303 | 1438303 | 1 | 1 | | | | | | | | | | | | | | | | |
| 360425 | SW-846:6010C | 1433383 | 1433382 | 1 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360425 | SW-846:6020 | 1433355 | 1433354 | 1 | 1 | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 360425 | SW-846:6850 | 1434068 | 1434067 | 1 | 1 | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 360425 | SW-846:8011 | 1433586 | 1433585 | 1 | 1 | 1 | | | 1 | | | | | 1 | 1 | | | | | | |
| 360425 | SW-846:8082 | 1439239 | 1439235 | 1 | 1 | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 360425 | SW-846:8151A | 1433733 | 1433729 | 1 | 1 | | | | 1 | 1 | | | | 1 | 1 | | | | | | |
| 360425 | SW-846:8260B | 1434601 | 1434601 | 1 | 1 | 1 | | | 2 | | | | | 4 | | | | | | | |
| 360425 | SW-846:8270D | 1433727 | 1433726 | 1 | 1 | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 360425 | SW-846:8310 | 1433806 | 1433805 | 1 | 1 | | | | 1 | 1 | | | | 1 | 1 | | | | | | |
| 360425 | SW-846:8321A_MOD | 1433023 | 1433022 | 1 | 1 | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 360425 | SW-846:9060 | 1435687 | 1435687 | 1 | 1 | | | | 1 | | | | | 1 | | | | 2 | | | |

# DATA VALIDATION REPORT

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-15-90235 | 1203209653 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203209652 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAPA-14-87212 | 1203203395 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203203393 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | WSTMO-14-86604 | 1203203394 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAPA-14-87208 | 1203202509 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203202508 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203202507 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-89222 | 360425009 | FD | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-89229 | 360425003 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203208388 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203208387 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | WST05-15-90481 | 1203208389 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | WST05-15-90481 | 1203208390 | MS | 0 | 0 | 1 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAPA-14-89329 | 1203211473 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CASA-15-90258 | 1203211474 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-89223 | 360425013 | FD | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAWR-14-89236 | 360425016 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203211472 | LCS | 0 | 0 | 4 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203211471 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-14-87212 | 1203207410 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAPA-14-87212 | 1203207413 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-89223 | 360425013 | FD | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAWR-14-89236 | 360425016 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203207407 | LCS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | MB | 1203207405 | MB | 2 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAPA-14-87192 | 1203200100 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAPA-14-87192 | 1203200103 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-89222 | 360425009 | FD | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAWR-14-89229 | 360425003 | REG | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203200098 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203200097 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-89223 | 1203204150 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-89223 | 1203204152 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203204148 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203204147 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-14-87195 | 1203197573 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAPA-14-87195 | 1203197574 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-89222 | 360425009 | FD | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAWR-14-89229 | 360425003 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203197572 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203197571 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-89223 | 1203204185 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203204184 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203204183 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203202127 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203202126 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | NP048-15-89157 | 1203207258 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | NP048-15-89157 | 1203207259 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | WSTMO-14-87080 | 1203202128 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | WSTMO-14-87080 | 1203202129 | MS | 0 | 0 | 1 | 0 |
| EPA:900 | RAD | CAPA-14-87204 | 1203202543 | DUP | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAPA-14-87204 | 1203202544 | MS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | CAPA-14-87204 | 1203202545 | MSD | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | CAWR-14-89222 | 360425009 | FD | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | CAWR-14-89229 | 360425003 | REG | 2 | 0 | 0 | 0 |
| EPA:900 | RAD | LCS | 1203202546 | LCS | 0 | 0 | 2 | 0 |
| EPA:900 | RAD | MB | 1203202542 | MB | 2 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAPA-14-87204 | 1203204248 | DUP | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-89222 | 360425009 | FD | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | CAWR-14-89229 | 360425003 | REG | 5 | 0 | 0 | 0 |
| EPA:901.1 | RAD | LCS | 1203204249 | LCS | 0 | 0 | 3 | 0 |
| EPA:901.1 | RAD | MB | 1203204247 | MB | 5 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAPA-14-87194 | 1203206648 | DUP | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| EPA:905.0 | RAD | CAPA-14-87194 | 1203206649 | MS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | CAWR-14-89222 | 360425009 | FD | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | CAWR-14-89229 | 360425003 | REG | 1 | 0 | 0 | 0 |
| EPA:905.0 | RAD | LCS | 1203206650 | LCS | 0 | 0 | 1 | 0 |
| EPA:905.0 | RAD | MB | 1203206647 | MB | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAPA-14-87186 | 1203212996 | DUP | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-89222 | 360425009 | FD | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | CAWR-14-89229 | 360425003 | REG | 1 | 0 | 0 | 0 |
| HASL-300:AM-241 | RAD | LCS | 1203212997 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:AM-241 | RAD | MB | 1203212995 | MB | 1 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAPA-14-87186 | 1203212999 | DUP | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-89222 | 360425009 | FD | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | CAWR-14-89229 | 360425003 | REG | 2 | 0 | 0 | 0 |
| HASL-300:ISOPU | RAD | LCS | 1203213000 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOPU | RAD | MB | 1203212998 | MB | 2 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-89222 | 360425009 | FD | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | CAWR-14-89229 | 360425003 | REG | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | LCS | 1203202689 | LCS | 0 | 0 | 1 | 0 |
| HASL-300:ISOU | RAD | MB | 1203202687 | MB | 3 | 0 | 0 | 0 |
| HASL-300:ISOU | RAD | WSTMO-14-86605 | 1203202688 | DUP | 3 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAPA-14-87230 | 1203202616 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAPA-14-87230 | 1203202617 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-89223 | 360425013 | FD | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAWR-14-89236 | 360425016 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203202615 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203202614 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAPA-14-87230 | 1203202554 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAPA-14-87230 | 1203202555 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-89223 | 360425013 | FD | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAWR-14-89236 | 360425016 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203202553 | LCS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | MB | 1203202552 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAPA-14-87230 | 1203204336 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAPA-14-87230 | 1203204337 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-89223 | 360425013 | FD | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAWR-14-89236 | 360425016 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203204335 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203204334 | MB | 1 | 0 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8011 | VOC | CAWR-14-89222 | 360425007 | FD | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-89225 | 360425014 | FTB | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | CAWR-14-89229 | 360425001 | REG | 2 | 1 | 0 | 0 |
| SW-846:8011 | VOC | LCS | 1203203093 | LCS | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | LCSD | 1203203094 | LCSD | 0 | 1 | 2 | 0 |
| SW-846:8011 | VOC | MB | 1203203092 | MB | 2 | 1 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAPA-14-87182 | 1203217928 | MS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | CAPA-14-87182 | 1203217929 | MSD | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-89222 | 360425008 | FD | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | CAWR-14-89229 | 360425002 | REG | 8 | 2 | 0 | 0 |
| SW-846:8082 | PESTPCB | LCS | 1203217927 | LCS | 0 | 2 | 2 | 0 |
| SW-846:8082 | PESTPCB | MB | 1203217926 | MB | 8 | 2 | 0 | 0 |
| SW-846:8151A | HERB | CAPA-14-87204 | 1203203433 | MS | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | CAWR-14-89222 | 360425012 | FD | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | CAWR-14-89229 | 360425006 | REG | 1 | 1 | 0 | 0 |
| SW-846:8151A | HERB | LCS | 1203203432 | LCS | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | LCSD | 1203203437 | LCSD | 0 | 1 | 1 | 0 |
| SW-846:8151A | HERB | MB | 1203203431 | MB | 1 | 1 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-89222 | 360425009 | FD | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-89225 | 360425015 | FTB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | CAWR-14-89229 | 360425003 | REG | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | LCS | 1203205733 | LCS | 0 | 3 | 68 | 0 |
| SW-846:8260B | VOC | LCS | 1203205734 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | LCS | 1203209451 | LCS | 0 | 3 | 68 | 0 |
| SW-846:8260B | VOC | LCS | 1203209452 | LCS | 0 | 3 | 10 | 0 |
| SW-846:8260B | VOC | MB | 1203205732 | MB | 78 | 3 | 0 | 0 |
| SW-846:8260B | VOC | MB | 1203209450 | MB | 78 | 3 | 0 | 0 |
| SW-846:8270D | SVOC | CAPA-14-87204 | 1203203427 | MS | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | CAPA-14-87204 | 1203203428 | MSD | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | CAWR-14-89222 | 360425009 | FD | 61 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | CAWR-14-89229 | 360425003 | REG | 61 | 6 | 0 | 0 |
| SW-846:8270D | SVOC | LCS | 1203203426 | LCS | 0 | 6 | 57 | 0 |
| SW-846:8270D | SVOC | MB | 1203203425 | MB | 61 | 6 | 0 | 0 |
| SW-846:8310 | SVOC | CAPA-14-87204 | 1203203605 | MS | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | CAWR-14-89222 | 360425010 | FD | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | CAWR-14-89229 | 360425004 | REG | 18 | 1 | 0 | 0 |
| SW-846:8310 | SVOC | LCS | 1203203604 | LCS | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | LCSD | 1203203607 | LCSD | 0 | 1 | 18 | 0 |
| SW-846:8310 | SVOC | MB | 1203203603 | MB | 18 | 1 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | CAWR-14-89222 | 360425011 | FD | 20 | 2 | 0 | 0 |

# DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| SW-846:8321A_MOD | LCMS/MS HIGH | CAWR-14-89229 | 360425005 | REG | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | LCS | 1203201688 | LCS | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | MB | 1203201687 | MB | 20 | 2 | 0 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | WSTMO-14-86605 | 1203201689 | MS | 0 | 2 | 20 | 0 |
| SW-846:8321A_MOD | LCMS/MS HIGH | WSTMO-14-86605 | 1203201690 | MSD | 0 | 2 | 20 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-15-90216 | 1203208553 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAPA-14-87201 | 1203208552 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-89222 | 360425009 | FD | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAWR-14-89229 | 360425003 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203208551 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203208550 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

| Field Sample ID | Lab Sample ID | Analytical Method | Sample Date | Extraction Date | Analysis Date | Extraction Hold Time | Max Extract Hold Time | Reject Above | Exceeds Limit | Analysis Hold Time | Max Analysis Hold Time | Reject Above | Exceeds Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89222 | 360425009 | SW-846:9060 | 10-30-2014 | | 11-17-2014 | NA | | | | 18 | 14 | 28 | X |
| CAWR-14-89229 | 360425003 | SW-846:9060 | 10-30-2014 | | 11-17-2014 | NA | | | | 18 | 14 | 28 | X |

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203202687 | METHOD BLANK | HASL-300:ISOU | W | Uranium-234 | .0408 | | pCi/L | 0.0309 |

# DATA VALIDATION REPORT

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|---|---|---|---|---|---|---|---|---|---|
| MB | 1203204147 | METHOD BLANK | EPA:350.1 | W | Ammonia as Nitrogen | 0.0209 | J | mg/L | 0.050 |

| Field Sample ID | Blank Lab | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Use Factors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89223 | 1203204147 | METHOD BLANK | EPA:350.1 | Ammonia as Nitrogen | 0.0209 | mg/L | 0.106 | | 0.050 | Y | 5 | 100 | Y |
| CAWR-14-89236 | 1203204147 | METHOD BLANK | EPA:350.1 | Ammonia as Nitrogen | 0.0209 | mg/L | 0.162 | | 0.050 | Y | 5 | 100 | Y |
| CAWR-14-89229 | 1203202687 | METHOD BLANK | HASL-300:ISOU | Uranium-234 | .0408 | pCi/L | .204 | | 0.039 | Y | 5 | 100 | Y |
| CAWR-14-89222 | 1203202687 | METHOD BLANK | HASL-300:ISOU | Uranium-234 | .0408 | pCi/L | .238 | | 0.0383 | Y | 5 | 100 | Y |

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPA-14-87192 | 1203200103 | | EPA:335.4 | Cyanide (Total) | 1432347 | 11-06-2014 | W | 115 | | 110 | 90 | 10 | | |
| CAPA-14-87195 | 1203197574 | | EPA:351.2 | Total Kjeldahl Nitrogen | 1431333 | 11-11-2014 | W | 111 | | 110 | 90 | 10 | | |
| WSTMO-14-87080 | 1203202129 | | EPA:365.4 | Total Phosphate as Phosphorus | 1433197 | 11-11-2014 | W | -300 | | 141 | 59 | 10 | | |

# DATA VALIDATION REPORT

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1203205733 | | SW-846:8260B | Dichlorodifluoromethane | 1434601 | 11-10-2014 | W | 139 | | 134 | 52 | | 10 | | |
| 1203205733 | | SW-846:8260B | Trichlorofluoromethane | 1434601 | 11-10-2014 | W | 130 | | 129 | 69 | | 10 | | |
| 1203209451 | | SW-846:8260B | Propylbenzene[1-] | 1434601 | 11-13-2014 | W | 70 | | 121 | 75 | | 10 | | |
| 1203201688 | | SW-846:8321A_MOD | HMX | 1433022 | 11-30-2014 | W | 121 | | 118 | 61 | | 10 | | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | -.136 | pCi/L | -.136 | pCi/L | 0.474 | 0.101 | W | 10/30/2014 | | 1437369 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | 2.17 | pCi/L | 2.17 | pCi/L | 5.72 | 1.52 | W | 10/30/2014 | | 1434033 | VAL | Y |

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | -2.76 | pCi/L | -2.76 | pCi/L | 5.26 | 1.65 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | .388 | pCi/L | .388 | pCi/L | 1.41 | 0.412 | W | 10/30/2014 | | 1433352 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | 2.51 | pCi/L | 2.51 | pCi/L | 9.50 | 2.63 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | .0000000057 | pCi/L | .00000000574 | pCi/L | 0.231 | 0.0422 | W | 10/30/2014 | | 1437370 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -.0172 | pCi/L | -.0172 | pCi/L | 0.340 | 0.0455 | W | 10/30/2014 | | 1437370 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | -12.8 | pCi/L | -12.8 | pCi/L | 70.1 | 19.0 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | VOC | SW-846:8260B | Propylbenzene[1-] | U | UJ | V12a | N | 1.00 | ug/L | 1.00 | ug/L | | | W | 10/30/2014 | | 1434601 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | .629 | pCi/L | .629 | pCi/L | 4.90 | 1.43 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | .0938 | pCi/L | .0938 | pCi/L | 0.486 | 0.141 | W | 10/30/2014 | | 1434929 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | | J- | I9 | Y | 2.85 | mg/L | 2.85 | mg/L | | | W | 10/30/2014 | | 1435687 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | HASL-300:ISOU | Uranium-234 | | J | R4a | Y | .238 | pCi/L | .238 | pCi/L | 0.0383 | 0.0227 | W | 10/30/2014 | | 1433419 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89222 | FD | INIT | RAD | HASL-300:ISOU | Uranium-235/236 | U | U | R5 | N | .0116 | pCi/L | .0116 | pCi/L | 0.0334 | 0.00694 | W | 10/30/2014 | | 1433419 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89223 | FD | INIT | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | | J | I4a | Y | 0.106 | mg/L | 0.106 | mg/L | | | W | 10/30/2014 | | 1433995 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89225 | FTB | INIT | VOC | SW-846:8260B | Propylbenzene[1-] | U | UJ | V12a | N | 1.00 | ug/L | 1.00 | ug/L | | | W | 10/30/2014 | | 1434601 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | HASL-300:AM-241 | Americium-241 | U | U | R5 | N | .0385 | pCi/L | .0385 | pCi/L | 0.402 | 0.0545 | W | 10/30/2014 | | 1437369 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | EPA:901.1 | Cesium-137 | U | U | R5 | N | .179 | pCi/L | .179 | pCi/L | 4.24 | 1.13 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | EPA:901.1 | Cobalt-60 | U | U | R5 | N | -.977 | pCi/L | -.977 | pCi/L | 4.31 | 1.20 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | EPA:900 | Gross alpha | U | U | R5 | N | .713 | pCi/L | .713 | pCi/L | 1.58 | 0.474 | W | 10/30/2014 | | 1433352 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | EPA:900 | Gross beta | U | U | R5 | N | 1.37 | pCi/L | 1.37 | pCi/L | 1.47 | 0.456 | W | 10/30/2014 | | 1433352 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | EPA:901.1 | Neptunium-237 | U | U | R5 | N | .886 | pCi/L | .886 | pCi/L | 8.89 | 2.48 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-238 | U | U | R5 | N | .0643 | pCi/L | .0643 | pCi/L | 0.215 | 0.0454 | W | 10/30/2014 | | 1437370 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | HASL-300:ISOPU | Plutonium-239/240 | U | U | R5 | N | -.0803 | pCi/L | -.0803 | pCi/L | 0.318 | 0.0579 | W | 10/30/2014 | | 1437370 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | EPA:901.1 | Potassium-40 | U | U | R5 | N | -3.62 | pCi/L | -3.62 | pCi/L | 57.6 | 15.6 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | VOC | SW-846:8260B | Propylbenzene[1-] | U | UJ | V12a | N | 1.00 | ug/L | 1.00 | ug/L | | | W | 10/30/2014 | | 1434601 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | EPA:901.1 | Sodium-22 | U | U | R5 | N | .19 | pCi/L | .19 | pCi/L | 4.60 | 1.18 | W | 10/30/2014 | | 1434033 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | EPA:905.0 | Strontium-90 | U | U | R5 | N | .464 | pCi/L | .464 | pCi/L | 0.480 | 0.160 | W | 10/30/2014 | | 1434929 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | GENERAL CHEMISTRY | SW-846:9060 | Total Organic Carbon | | J- | I9 | Y | 2.91 | mg/L | 2.91 | mg/L | | | W | 10/30/2014 | | 1435687 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | HASL-300:ISOU | Uranium-234 | | U | R4 | N | .204 | pCi/L | .204 | pCi/L | 0.039 | 0.0223 | W | 10/30/2014 | | 1433419 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89229 | REG | INIT | RAD | HASL-300:ISOU | Uranium-235/236 | U | U | R5 | N | .0118 | pCi/L | .0118 | pCi/L | 0.034 | 0.00781 | W | 10/30/2014 | | 1433419 | VAL | Y |
| Sacred Spring | 2015-207 | CAWR-14-89236 | REG | INIT | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | | J | I4a | Y | 0.162 | mg/L | 0.162 | mg/L | | | W | 10/30/2014 | | 1433995 | VAL | Y |

| Reason Code | Description |
|---|---|
| I4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x |
| I9 | The holding time was >1 and <=2 times the applicable holding time requirement. |
| J_LAB | The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL |
| NQ | The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample. |
| R4 | The sample result is <=5X the concentration of the related analyte in the method blank. |
| R4a | The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5X. |
| R5 | Analyte is not detected because the amount reported is less than the MDC. |
| U_LAB | The analytical laboratory qualified the analyte as not detected. |
| V12a | The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-89222 | Sacred Spring | FD | EPA:245.2 | 0 | 1 |
| CAWR-14-89222 | Sacred Spring | FD | EPA:335.4 | 0 | 1 |
| CAWR-14-89222 | Sacred Spring | FD | EPA:351.2 | 0 | 1 |
| CAWR-14-89222 | Sacred Spring | FD | EPA:900 | 0 | 2 |
| CAWR-14-89222 | Sacred Spring | FD | EPA:901.1 | 0 | 5 |
| CAWR-14-89222 | Sacred Spring | FD | EPA:905.0 | 0 | 1 |
| CAWR-14-89222 | Sacred Spring | FD | HASL-300:AM-241 | 0 | 1 |
| CAWR-14-89222 | Sacred Spring | FD | HASL-300:ISOPU | 0 | 2 |
| CAWR-14-89222 | Sacred Spring | FD | HASL-300:ISOU | 0 | 3 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8011 | 0 | 2 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8082 | 0 | 8 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8151A | 0 | 1 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8260B | 0 | 78 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8270D | 0 | 61 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8310 | 0 | 18 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:8321A_MOD | 0 | 20 |
| CAWR-14-89222 | Sacred Spring | FD | SW-846:9060 | 0 | 1 |
| CAWR-14-89223 | Sacred Spring | FD | EPA:120.1 | 0 | 1 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-89223 | Sacred Spring | FD | EPA:150.1 | 0 | 1 |
| CAWR-14-89223 | Sacred Spring | FD | EPA:160.1 | 0 | 1 |
| CAWR-14-89223 | Sacred Spring | FD | EPA:245.2 | 0 | 1 |
| CAWR-14-89223 | Sacred Spring | FD | EPA:300.0 | 0 | 4 |
| CAWR-14-89223 | Sacred Spring | FD | EPA:310.1 | 0 | 2 |
| CAWR-14-89223 | Sacred Spring | FD | EPA:350.1 | 0 | 1 |
| CAWR-14-89223 | Sacred Spring | FD | EPA:353.2 | 0 | 1 |
| CAWR-14-89223 | Sacred Spring | FD | EPA:365.4 | 0 | 1 |
| CAWR-14-89223 | Sacred Spring | FD | SM:A2340B | 0 | 1 |
| CAWR-14-89223 | Sacred Spring | FD | SW-846:6010C | 0 | 17 |
| CAWR-14-89223 | Sacred Spring | FD | SW-846:6020 | 0 | 11 |
| CAWR-14-89223 | Sacred Spring | FD | SW-846:6850 | 0 | 1 |
| CAWR-14-89225 | Sacred Spring | FTB | SW-846:8011 | 0 | 2 |
| CAWR-14-89225 | Sacred Spring | FTB | SW-846:8260B | 0 | 78 |
| CAWR-14-89229 | Sacred Spring | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-89229 | Sacred Spring | REG | EPA:335.4 | 0 | 1 |
| CAWR-14-89229 | Sacred Spring | REG | EPA:351.2 | 0 | 1 |
| CAWR-14-89229 | Sacred Spring | REG | EPA:900 | 0 | 2 |
| CAWR-14-89229 | Sacred Spring | REG | EPA:901.1 | 0 | 5 |
| CAWR-14-89229 | Sacred Spring | REG | EPA:905.0 | 0 | 1 |
| CAWR-14-89229 | Sacred Spring | REG | HASL-300:AM-241 | 0 | 1 |
| CAWR-14-89229 | Sacred Spring | REG | HASL-300:ISOPU | 0 | 2 |
| CAWR-14-89229 | Sacred Spring | REG | HASL-300:ISOU | 0 | 3 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8011 | 0 | 2 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8082 | 0 | 8 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8151A | 0 | 1 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8260B | 0 | 78 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8270D | 0 | 61 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8310 | 0 | 18 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:8321A_MOD | 0 | 20 |
| CAWR-14-89229 | Sacred Spring | REG | SW-846:9060 | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | EPA:120.1 | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | EPA:150.1 | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | EPA:160.1 | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | EPA:245.2 | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | EPA:300.0 | 0 | 4 |
| CAWR-14-89236 | Sacred Spring | REG | EPA:310.1 | 0 | 2 |

# DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-89236 | Sacred Spring | REG | EPA:350.1 | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | EPA:353.2 | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | EPA:365.4 | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | SM:A2340B | 0 | 1 |
| CAWR-14-89236 | Sacred Spring | REG | SW-846:6010C | 0 | 17 |
| CAWR-14-89236 | Sacred Spring | REG | SW-846:6020 | 0 | 11 |
| CAWR-14-89236 | Sacred Spring | REG | SW-846:6850 | 0 | 1 |

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

December 01, 2014

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Groundwater Samples
Work Order: 360425
SDG: 2015-207

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on November 04, 2014, and analyzed for Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2015-207
Enclosures

**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Work Order #: 360425**
**SDG: 2015-207**

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# Case Narrative

**Case Narrative for**
**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**
**LANL-WQH Groundwater Samples**
**Workorder #: 360425**
**SDG # : 2015-207**

**December 01, 2014**

**Laboratory Identification:**

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on November 04, 2014 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| Laboratory ID | Client ID |
|---|---|
| 360425001 | CAWR-14-89229 |
| 360425002 | CAWR-14-89229 |
| 360425003 | CAWR-14-89229 |
| 360425004 | CAWR-14-89229 |
| 360425005 | CAWR-14-89229 |
| 360425006 | CAWR-14-89229 |
| 360425007 | CAWR-14-89222 |
| 360425008 | CAWR-14-89222 |
| 360425009 | CAWR-14-89222 |
| 360425010 | CAWR-14-89222 |
| 360425011 | CAWR-14-89222 |
| 360425012 | CAWR-14-89222 |
| 360425013 | CAWR-14-89223 |
| 360425014 | CAWR-14-89225 |
| 360425015 | CAWR-14-89225 |
| 360425016 | CAWR-14-89236 |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile PCB, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, Metals, Perchlorates by LCMSMS and Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

Hope Taylor for
Valerie Davis
Project Manager

**List of current GEL Certifications as of 01 December 2014**

| State | Certification |
|---|---|
| Alaska | UST−110 |
| Arkansas | 88−0651 |
| CLIA | 42D0904046 |
| California NELAP | 01151CA |
| Colorado | SC00012 |
| Connecticut | PH−0169 |
| Delaware | SC000122013−10 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330−12−00283, P330−12−00284 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC000122013−10 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C−SC−01 |
| Kansas NELAP | E−10332 |
| Kentucky | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA130005 |
| Maryland | 270 |
| Massachusetts | M−SC012 |
| Michigan | 9976 |
| Mississippi | SC000122013−10 |
| Nebraska | NE−OS−26−13 |
| Nevada | SC000122014−1 |
| New Hampshire NELAP | 2054 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68−00485 |
| Plant Material Permit | PDEP−12−00260 |
| South Carolina Chemistry | 10120001 |
| South Carolina GVL | 23611001 |
| South Carolina Radiochemi | 10120002 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235−14−9 |
| Utah NELAP | SC000122014−16 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780−12 |
| Wisconsin | 999887790 |

# Chain of Custody and Supporting Documentation

360425

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

# Chain of Custody/Analysis Request

ADEP

COC/Lab Request #: 2015-207

Page 1 of 1

Client Contact:

Lab Agreement # : 126310011

Project Number :

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: Yes, Below Background

Lab Reporting Limit Type: Sample Quantitation Limit

Special Instructions:

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | MSGP-Hg | WSP-8011-EDB_DBCP | WSP-8011-TB | WSP-8082-PCB | WSP-8260B-VOA | WSP-8270C-SVOA | WSP-8310-PAH | WSP-8321A-NMED HEXP | WSP-All Metals | WSP-CN(T) | WSP-GENINORG+PerChlorate | WSP-GrossA/B | WSP-LL-8151A-PCP | WSP-NH3+NO3/NO2+PO4 | WSP-RAD | WSP-TKN+TOC | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAWR-14-89229 | Oct 30 2014 | 13:40 | W | 1 | 2 | | 8 1 | 2 | 2 | 2 | 8 2 | | 1 | | 1 | 2 | | 1 | 1 | | | | |
| CAWR-14-89222 | Oct 30 2014 | 13:40 | W | 1 | 2 | | 8 1 | 2 | 2 1 | 2 1 | 8 1 | | 1 | | 1 | 2 1 | | 1 | 1 | | | | |
| CAWR-14-89223 | Oct 30 2014 | 13:40 | W | | | | | | | | | 1 | | 1 | | | 1 | | | | | | |
| CAWR-14-89225 | Oct 30 2014 | 13:40 | W | | | 1 | | 2 1 | | | | | | | | | | | | | | | |
| CAWR-14-89236 | Oct 30 2014 | 13:40 | W | | | | | | | | | 1 | | 1 | | | 1 | | | | | | |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| Sherri Sherwood | Sherri Sherwood | 11/3/14 3pm | [illegible] | Shanta Mack | 11/4/14 9:10 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

GEL Laboratories LLC

# SAMPLE RECEIPT & REVIEW FORM

| | |
|---|---|
| Client: LANL | SDG/AR/COC/Work Order: 2015-207 |
| Received By: SHANTA MACK | Date Received: 11/4/14 @ 9:10 |

| Suspected Hazard Information | Yes | No | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
|---|---|---|---|
| COC/Samples marked as radioactive? | | ✓ | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): DCPM |
| Classified Radioactive II or III by RSO? | | ✓ | If yes, Were swipes taken of sample contatiners < action levels? |
| COC/Samples marked containing PCBs? | | ✓ | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | ✓ | If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | ✓ | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | ✓ | |

| | Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|---|---|---|---|---|
| 1 | Shipping containers received intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | ✓ | | | Preservation Method: Ice bags Blue ice Dry ice None Other (describe) 2,3C *all temperatures are recorded in Celsius 19C (RAD) |
| 2a | Daily check performed and passed on IR temperature gun? | ✓ | | | Temperature Device Serial #: 130532792 Secondary Temperature Device Serial # (If Applicable): |
| 3 | Chain of custody documents included with shipment? | ✓ | | | |
| 4 | Sample containers intact and sealed? | ✓ | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | | | ✓ | Sample ID's, containers affected and observed pH: CAWR-14-89236 HNO3 added at lab If Preservation added, Lot#: 80838 metals container has ph=7 |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | ✓ | | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | ✓ | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | ✓ | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | ✓ | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | ✓ | | | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | ✓ | | | Sample ID's affected: |
| 12 | Are sample containers identifiable as GEL provided? | | | ✓ | |
| 13 | COC form is properly signed in relinquished/received sections? | ✓ | | | |
| 14 | Carrier and tracking number. | | | | Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other<br>5908 1778 0543<br>5908 1778 0484<br>5908 1778 0510<br>5908 1778 0532<br>5908 1778 0565<br>5908 1778 0521<br>5908 1778 0576<br>5908 1778 0500 |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials VSO Date 11/5/14 Page 1 of 1 GL-CHL-SR-001

**Subject:** Sample Receipt 11/4/14
**From:** Shanta Mack <sha01289@gel.com>
**Date:** Tue, 04 Nov 2014 18:41:55 -0500
**To:** Keith Green <kgreene@lanl.gov>, team.DAVIS@GEL.COM

Field Chain of Custody container for CN was received with a ph of 7, Naoh was added at lab. Lot # 2060432

RN 2015-207 CAWR-14-89236 container for Metals was received with a ph oh 7, Hno3 was added at lab. Lot# 80838

RN 2015-208 CAPA-14-87154 container for CN was received with a ph of 7, Naoh was added at lab. Lot # 2060432

~~CAPA-14-87179 lab did not receive a VOA container~~ VSO 11/5/14

CAPA-14-87205 lab only received 1 container for 8011 TB

Shanta Mack <sha01289@gel.com>
Project Manager Assistant
Customer Service
The Gel Group

SVCS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 43.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

2c

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

FedEx Express

1 of 3

TRK# 0201 5908 1778 0543

## MASTER ##

X7 CHSA

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

29407
SC-US CHS

Part # 156148-434 RITZ 10/11 ©

SVCS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 57.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

1gc

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

FedEx Express

1 of 3

TRK# 0201 5908 1778 0484

## MASTER ##

X7 CHSA

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

29407
SC-US CHS

Part # 156148-434 RITZ 10/11 ©

SVCS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

3C

FedEx Express

1 of 3

TRK# 0201 5908 1778 0510

## MASTER ##

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156149-434 RITZ 10/11 ©

SVCS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

3C

FedEx Express

3 of 3

MPS# 0263 5908 1778 0532

Mstr# 5908 1778 0510

0201

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156149-434 RITZ 10/11 ©

SYS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3C

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

FedEx Express

3 of 3
MPS# 0263 5908 1778 0565
Mstr# 5908 1778 0543 0201

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156149-434 RIT2 10/11 ©

SYS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

2C

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

FedEx Express

2 of 3
MPS# 0263 5908 1778 0554
Mstr# 5908 1778 0543 0201

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156149-434 RIT2 10/11 ©

SYCS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3L

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

FedEx Express

2 of 3

MPS# 0263 5908 1778 0521
Mstr# 5908 1778 0510 0201

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156140-434 RITZ 10/11

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3L

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100

FedEx Express

TRK# 0201 5908 1778 0576

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156140-434 RITZ 10/11

SYGS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3C

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

FedEx Express

3 of 3
MPS# 0263 5908 1778 0500
Mstr# 5908 1778 0484
0201

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 159149-434 RITZ 10/11 ©

SYGS: PRIORITY OVER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV14
ACTWGT: 24.0 LB MAN
CAD: 0014176/CAFE2806

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

1 9C

CHARLESTON SC 29407
(843) 556-8171
REF: MR1A015AGWF0

FedEx Express

2 of 3
MPS# 0263 5908 1778 0495
Mstr# 5908 1778 0484
0201

TUE - 04 NOV 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 159149-434 RITZ 10/11 ©

# Data Review Qualifier Flag Definition Sheet

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# Case Narrative

**ChemStation Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer** |
| Analytical Method: | SW846 8260B DOE-AL |
| Analytical Batch Number: | 1434601 |

## Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 360425015 | CAWR-14-89225 |
| 1203205732 | Method Blank (MB) |
| 1203205733 | Laboratory Control Sample (LCS) |
| 1203205734 | Laboratory Control Sample (LCS) |
| 1203205735 | 360759006(WST05-15-90482) Post Spike (PS) |
| 1203205736 | 360759006(WST05-15-90482) Post Spike (PS) |
| 1203205737 | 360759006(WST05-15-90482) Post Spike Duplicate (PSD) |
| 1203205738 | 360759006(WST05-15-90482) Post Spike Duplicate (PSD) |
| 1203209450 | Method Blank (MB) |
| 1203209451 | Laboratory Control Sample (LCS) |
| 1203209452 | Laboratory Control Sample (LCS) |

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

## Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate

recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification Requirements**
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Blank (MB) Statement**
The blanks analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

**Laboratory Control Sample (LCS) Recovery**
The LCS 1203205733 (LCS) and 1203209451 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported.

**QC Sample Designation**
Sample 360759006 (WST05-15-90482) was designated for spike analysis.

**Matrix Spike (PS) Recovery Statement**
The spike recoveries were within the required acceptance limits.

**Matrix Spike Duplicate (PSD) Recovery Statement**
The spike duplicate recoveries were within the required acceptance limits.

**Relative Percent Difference (RPD) Statement**
The RPDs between the matrix spike pair met the acceptance limits.

**Internal Standard (ISTD) Acceptance**
The internal standard responses in all client and quality control samples met the required acceptance criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Sample Preservation and Integrity**
All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-analyses were not required for samples in this SDG.

**Miscellaneous Information**

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1355677.

**Manual Integrations**
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

**Additional Comments**
Additional comments were not required for this SDG.

**Residual Chlorine**
Residual Chlorine was not detected in any of the samples in this SDG.

**System Configuration**

The Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description | P & T Trap |
|---|---|---|---|---|---|
| VOA1.I | Agilent 6890/5973 GC/MS w/ OI 4560/Archon Autosampler | HP6890/HP5973 | RTX-624 | Restek, 60m x 0.25mm x 1.4um | Trap 10 |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207  GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert  **Name:** **Erin Haubert**

**Date:** **28 NOV 2014**  **Title:** **Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425003** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 19:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 19:12** | | | | |
| **Data File:** | **111014V1\1I120.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425003** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 19:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 19:12** | | | | |
| **Data File:** | **111014V1\1I120.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425003** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 19:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 19:12** | | | | |
| **Data File:** | **111014V1\1I120.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 51.2 | 50.0 | ug/L | 102 | (77%-123%) |
| Bromofluorobenzene | 44.2 | 50.0 | ug/L | 88.3 | (80%-120%) |
| Toluene-d8 | 45.2 | 50.0 | ug/L | 90.4 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425009** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 19:44** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 19:44** | | | | |
| **Data File:** | **111014V1\1I121.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425009** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 19:44** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 19:44** | | | | |
| **Data File:** | **111014V1\1I121.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425009** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 19:44** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 19:44** | | | | |
| **Data File:** | **111014V1\1I121.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.1 | 50.0 | ug/L | 104 | (77%-123%) |
| Bromofluorobenzene | 43.8 | 50.0 | ug/L | 87.6 | (80%-120%) |
| Toluene-d8 | 46.1 | 50.0 | ug/L | 92.2 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425015** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89225** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 20:16** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 20:16** | | | | |
| **Data File:** | **111014V1\1I122.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.200 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 3.00 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425015** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89225** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 20:16** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 20:16** | | | | |
| **Data File:** | **111014V1\1I122.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.00 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.400 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425015** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **VOA** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89225** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 20:16** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 20:16** | | | | |
| **Data File:** | **111014V1\1I122.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 51.1 | 50.0 | ug/L | 102 | (77%-123%) |
| Bromofluorobenzene | 45.8 | 50.0 | ug/L | 91.6 | (80%-120%) |
| Toluene-d8 | 45.7 | 50.0 | ug/L | 91.4 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Quality Control Summary

**Volatile**

## Surrogate Recovery Report

**SDG Number: 2015-207**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCED4 %REC | TOL %REC | BFB %REC |
|---|---|---|---|---|
| 1203205733 | LCS for batch 1434601 | 96 | 90 | 85 |
| 1203205734 | LCS for batch 1434601 | 100 | 92 | 86 |
| 1203205732 | MB for batch 1434601 | 100 | 93 | 87 |
| 360425003 | CAWR-14-89229 | 102 | 90 | 88 |
| 360425009 | CAWR-14-89222 | 104 | 92 | 88 |
| 360425015 | CAWR-14-89225 | 102 | 91 | 92 |
| 1203209451 | LCS for batch 1434601 | 105 | 88 | 86 |
| 1203209452 | LCS for batch 1434601 | 102 | 88 | 85 |
| 1203209450 | MB for batch 1434601 | 104 | 89 | 87 |
| 1203205735 | WST05-15-90482PS | 99 | 89 | 87 |
| 1203205737 | WST05-15-90482PSD | 107 | 89 | 87 |
| 1203205736 | WST05-15-90482PS | 98 | 88 | 88 |
| 1203205738 | WST05-15-90482PSD | 97 | 88 | 87 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| DCED4 | = 1,2-Dichloroethane-d4 | (77%-123%) |
| TOL | = Toluene-d8 | (80%-120%) |
| BFB | = Bromofluorobenzene | (80%-120%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205733**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 10:26**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 101 | 101 | 78-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 991 | 79 | 60-124 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 258 | 103 | 55-147 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 285 | 114 | 72-126 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 262 | 105 | 73-135 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 231 | 92 | 61-133 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 227 | 91 | 57-145 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 209 | 84 | 67-128 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 206 | 83 | 59-147 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 69.4 | 139 * | 52-134 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 47.3 | 95 | 57-126 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 52.7 | 105 | 62-126 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 56.8 | 114 | 63-127 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 47.6 | 95 | 69-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 65.0 | 130 * | 69-129 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 48.2 | 96 | 72-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 55.0 | 110 | 70-127 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 47.1 | 94 | 70-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 50.4 | 101 | 74-120 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 51.4 | 103 | 73-120 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 50.8 | 102 | 75-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 52.9 | 106 | 76-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205733**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 10:26**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 61.8 | 124 | 76-131 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 57.3 | 115 | 76-122 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 55.7 | 111 | 76-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 64.0 | 128 | 76-131 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 52.6 | 105 | 73-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 66.8 | 134 | 76-135 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 55.1 | 110 | 71-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 48.8 | 98 | 75-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 57.0 | 114 | 77-123 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 45.3 | 91 | 76-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 53.1 | 106 | 77-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 55.9 | 112 | 78-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 53.9 | 108 | 78-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 48.4 | 97 | 75-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 54.2 | 108 | 78-124 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 47.4 | 95 | 76-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 46.3 | 93 | 73-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 57.5 | 115 | 73-125 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 61.4 | 123 | 72-131 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 50.5 | 101 | 77-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 51.1 | 102 | 77-120 |
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 50.4 | 101 | 78-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205733**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 10:26**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 49.9 | 100 | 79-124 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 62.4 | 125 | 65-132 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 50.1 | 100 | 76-123 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 46.3 | 93 | 72-122 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 50.2 | 100 | 71-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 50.5 | 101 | 76-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 47.0 | 94 | 75-121 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 50.0 | 100 | 77-122 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 50.8 | 102 | 76-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 47.7 | 95 | 76-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 52.0 | 104 | 77-127 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 48.8 | 98 | 77-121 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 51.5 | 103 | 77-124 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 52.7 | 105 | 77-126 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 50.4 | 101 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 50.4 | 101 | 76-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 49.0 | 98 | 76-127 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 60.3 | 121 | 69-133 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 52.4 | 105 | 67-129 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 55.1 | 110 | 66-131 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 54.3 | 109 | 68-132 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 58.2 | 116 | 80-126 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Sample Type:** **Laboratory Control Sample**
**Client ID:** **LCS for batch 1434601**
**Matrix:** **WATER**
**Lab Sample ID** **1203205733**
**Instrument:** **VOA1.I**
**Analysis Date:** **11/10/2014 10:26**
**Dilution: 1**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 50.6 | 101 | 77-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4940 | 99 | 61-135 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203205734**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 12:05**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 248 | 99 | 61-132 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 333 | 133 | 67-139 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 242 | 97 | 64-124 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 246 | 98 | 68-123 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 253 | 101 | 69-128 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 243 | 97 | 66-124 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 263 | 105 | 73-123 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 236 | 94 | 75-122 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 3090 | 124 | 64-132 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 60.0 | 120 | 60-137 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **WST05-15-90482PS**
**Lab Sample ID** **1203205735**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:00**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PS | m,p-Xylenes | 100 | 0.00 | U | 79.3 | 79 | 69-122 |
| 75-05-8 | PS | Acetonitrile | 1250 | 0.00 | U | 812 | 65 | 54-130 |
| 78-93-3 | PS | 2-Butanone | 250 | 2.70 | J | 169 | 66 | 30-145 |
| 74-88-4 | PS | Iodomethane | 250 | 0.00 | U | 264 | 106 | 69-128 |
| 75-15-0 | PS | Carbon disulfide | 250 | 0.00 | U | 198 | 79 | 68-138 |
| 108-05-4 | PS | Vinyl acetate | 250 | 0.00 | U | 170 | 68 | 50-137 |
| 108-10-1 | PS | 4-Methyl-2-pentanone | 250 | 0.00 | U | 182 | 73 | 60-132 |
| 591-78-6 | PS | 2-Hexanone | 250 | 0.00 | U | 139 | 55 | 38-144 |
| 67-64-1 | PS | Acetone | 250 | 203 | | 336 | 53 | 27-155 |
| 75-71-8 | PS | Dichlorodifluoromethane | 50.0 | 0.00 | U | 45.0 | 90 | 37-143 |
| 74-87-3 | PS | Chloromethane | 50.0 | 0.00 | U | 34.9 | 70 | 48-132 |
| 75-01-4 | PS | Vinyl chloride | 50.0 | 0.00 | U | 38.2 | 76 | 53-132 |
| 74-83-9 | PS | Bromomethane | 50.0 | 0.00 | U | 48.3 | 97 | 60-132 |
| 75-00-3 | PS | Chloroethane | 50.0 | 0.00 | U | 35.4 | 71 | 66-120 |
| 75-69-4 | PS | Trichlorofluoromethane | 50.0 | 0.00 | U | 52.5 | 105 | 64-131 |
| 60-29-7 | PS | Ethyl ether | 50.0 | 0.00 | U | 41.0 | 82 | 69-119 |
| 75-35-4 | PS | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 41.5 | 83 | 65-129 |
| 75-09-2 | PS | Methylene chloride | 50.0 | 0.00 | U | 40.6 | 81 | 68-119 |
| 1634-04-4 | PS | tert-Butyl methyl ether | 50.0 | 0.00 | U | 45.2 | 90 | 70-123 |
| 156-60-5 | PS | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 40.7 | 81 | 68-123 |
| 75-34-3 | PS | 1,1-Dichloroethane | 50.0 | 0.00 | U | 41.1 | 82 | 71-122 |
| 156-59-2 | PS | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 45.2 | 90 | 72-122 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Sample Type:** **Post Spike**
**Client ID:** **WST05-15-90482PS**
**Matrix:** **W**
**Lab Sample ID** **1203205735**
**Instrument:** **VOA1.I**
**Analysis Date:** **11/14/2014 02:00**
**Dilution: 1**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PS | 2,2-Dichloropropane | 50.0 | 0.00 | U | 46.5 | 93 | 69-131 |
| 74-97-5 | PS | Bromochloromethane | 50.0 | 0.00 | U | 54.6 | 109 | 74-123 |
| 67-66-3 | PS | Chloroform | 50.0 | 0.00 | U | 49.5 | 99 | 72-123 |
| 71-55-6 | PS | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 52.7 | 105 | 71-133 |
| 563-58-6 | PS | 1,1-Dichloropropene | 50.0 | 0.00 | U | 40.8 | 82 | 68-125 |
| 56-23-5 | PS | Carbon tetrachloride | 50.0 | 0.00 | U | 55.8 | 112 | 70-139 |
| 107-06-2 | PS | 1,2-Dichloroethane | 50.0 | 0.00 | U | 53.7 | 107 | 67-123 |
| 71-43-2 | PS | Benzene | 50.0 | 0.00 | U | 39.2 | 78 | 71-118 |
| 79-01-6 | PS | Trichloroethylene | 50.0 | 0.00 | U | 46.0 | 92 | 68-130 |
| 78-87-5 | PS | 1,2-Dichloropropane | 50.0 | 0.00 | U | 37.1 | 74 | 72-118 |
| 74-95-3 | PS | Dibromomethane | 50.0 | 0.00 | U | 50.3 | 101 | 74-122 |
| 75-27-4 | PS | Bromodichloromethane | 50.0 | 0.00 | U | 53.1 | 106 | 75-129 |
| 10061-01-5 | PS | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 44.3 | 89 | 73-125 |
| 108-88-3 | PS | Toluene | 50.0 | 0.00 | U | 38.3 | 77 | 69-119 |
| 10061-02-6 | PS | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 44.7 | 89 | 73-125 |
| 79-00-5 | PS | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 40.9 | 82 | 73-118 |
| 142-28-9 | PS | 1,3-Dichloropropane | 50.0 | 0.00 | U | 41.9 | 84 | 71-116 |
| 127-18-4 | PS | Tetrachloroethylene | 50.0 | 0.00 | U | 45.3 | 91 | 65-128 |
| 124-48-1 | PS | Dibromochloromethane | 50.0 | 0.00 | U | 57.3 | 115 | 68-133 |
| 108-90-7 | PS | Chlorobenzene | 50.0 | 0.00 | U | 41.2 | 82 | 71-119 |
| 100-41-4 | PS | Ethylbenzene | 50.0 | 0.00 | U | 38.8 | 78 | 70-121 |
| 95-47-6 | PS | o-Xylene | 50.0 | 0.00 | U | 40.3 | 81 | 70-123 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **WST05-15-90482PS**
**Lab Sample ID** **1203205735**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:00**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 100-42-5 | PS | Styrene | 50.0 | 0.00 | U | 40.5 | 81 | 72-127 |
| 75-25-2 | PS | Bromoform | 50.0 | 0.00 | U | 59.7 | 119 | 60-133 |
| 98-82-8 | PS | Isopropylbenzene | 50.0 | 0.00 | U | 38.6 | 77 | 67-127 |
| 79-34-5 | PS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 41.5 | 83 | 67-125 |
| 96-18-4 | PS | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 50.7 | 101 | 68-123 |
| 108-86-1 | PS | Bromobenzene | 50.0 | 0.00 | U | 44.2 | 88 | 69-120 |
| 103-65-1 | PS | n-Propylbenzene | 50.0 | 0.00 | U | 33.4 | 67 | 65-125 |
| 108-67-8 | PS | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 38.7 | 77 | 67-126 |
| 95-49-8 | PS | 2-Chlorotoluene | 50.0 | 0.00 | U | 38.1 | 76 | 67-122 |
| 106-43-4 | PS | 4-Chlorotoluene | 50.0 | 0.00 | U | 35.6 | 71 | 66-121 |
| 98-06-6 | PS | tert-Butylbenzene | 50.0 | 0.00 | U | 40.5 | 81 | 67-130 |
| 95-63-6 | PS | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 36.8 | 74 | 66-124 |
| 135-98-8 | PS | sec-Butylbenzene | 50.0 | 0.00 | U | 37.9 | 76 | 67-128 |
| 99-87-6 | PS | 4-Isopropyltoluene | 50.0 | 0.00 | U | 38.8 | 78 | 66-129 |
| 541-73-1 | PS | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 40.7 | 81 | 67-120 |
| 106-46-7 | PS | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 40.1 | 80 | 66-118 |
| 104-51-8 | PS | n-Butylbenzene | 50.0 | 0.00 | U | 35.7 | 71 | 63-131 |
| 87-68-3 | PS | Hexachlorobutadiene | 50.0 | 0.00 | U | 47.8 | 96 | 55-138 |
| 91-20-3 | PS | Naphthalene | 50.0 | 0.00 | U | 48.1 | 96 | 61-131 |
| 87-61-6 | PS | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 44.6 | 89 | 56-133 |
| 120-82-1 | PS | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 44.7 | 89 | 56-131 |
| 630-20-6 | PS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 52.4 | 105 | 76-129 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Sample Type:** **Post Spike**
**Client ID:** **WST05-15-90482PS**
**Matrix:** **W**
**Lab Sample ID** **1203205735**
**Instrument:** **VOA1.I**
**Analysis Date:** **11/14/2014 02:00**
**Dilution: 1**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 95-50-1 | PS | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 43.0 | 86 | 69-119 |
| 71-36-3 | PS | n-Butyl alcohol | 5000 | 112 | | 4710 | 92 | 55-141 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Sample Type:** **Post Spike Duplicate**
**Client ID:** **WST05-15-90482PSD**
**Matrix:** **W**
**Lab Sample ID** **1203205737**
**Instrument:** **VOA1.I**
**Analysis Date:** **11/14/2014 02:32**
**Dilution: 1**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 179601-23-1 | PSD | m,p-Xylenes | 100 | 0.00 | U | 82.2 | 82 | 69-122 | 4 | 0-20 |
| 75-05-8 | PSD | Acetonitrile | 1250 | 0.00 | U | 894 | 72 | 54-130 | 10 | 0-20 |
| 78-93-3 | PSD | 2-Butanone | 250 | 2.70 | J | 184 | 73 | 30-145 | 9 | 0-20 |
| 74-88-4 | PSD | Iodomethane | 250 | 0.00 | U | 284 | 114 | 69-128 | 7 | 0-20 |
| 75-15-0 | PSD | Carbon disulfide | 250 | 0.00 | U | 216 | 86 | 68-138 | 9 | 0-20 |
| 108-05-4 | PSD | Vinyl acetate | 250 | 0.00 | U | 182 | 73 | 50-137 | 7 | 0-20 |
| 108-10-1 | PSD | 4-Methyl-2-pentanone | 250 | 0.00 | U | 182 | 73 | 60-132 | 0 | 0-20 |
| 591-78-6 | PSD | 2-Hexanone | 250 | 0.00 | U | 136 | 54 | 38-144 | 2 | 0-20 |
| 67-64-1 | PSD | Acetone | 250 | 203 | | 365 | 65 | 27-155 | 8 | 0-20 |
| 75-71-8 | PSD | Dichlorodifluoromethane | 50.0 | 0.00 | U | 44.5 | 89 | 37-143 | 1 | 0-20 |
| 74-87-3 | PSD | Chloromethane | 50.0 | 0.00 | U | 36.0 | 72 | 48-132 | 3 | 0-20 |
| 75-01-4 | PSD | Vinyl chloride | 50.0 | 0.00 | U | 38.7 | 77 | 53-132 | 2 | 0-20 |
| 74-83-9 | PSD | Bromomethane | 50.0 | 0.00 | U | 50.8 | 102 | 60-132 | 5 | 0-20 |
| 75-00-3 | PSD | Chloroethane | 50.0 | 0.00 | U | 37.6 | 75 | 66-120 | 6 | 0-20 |
| 75-69-4 | PSD | Trichlorofluoromethane | 50.0 | 0.00 | U | 53.1 | 106 | 64-131 | 1 | 0-20 |
| 60-29-7 | PSD | Ethyl ether | 50.0 | 0.00 | U | 44.0 | 88 | 69-119 | 7 | 0-20 |
| 75-35-4 | PSD | 1,1-Dichloroethylene | 50.0 | 0.00 | U | 44.5 | 89 | 65-129 | 7 | 0-20 |
| 75-09-2 | PSD | Methylene chloride | 50.0 | 0.00 | U | 43.4 | 87 | 68-119 | 7 | 0-20 |
| 1634-04-4 | PSD | tert-Butyl methyl ether | 50.0 | 0.00 | U | 48.6 | 97 | 70-123 | 7 | 0-20 |
| 156-60-5 | PSD | trans-1,2-Dichloroethylene | 50.0 | 0.00 | U | 43.3 | 87 | 68-123 | 6 | 0-20 |
| 75-34-3 | PSD | 1,1-Dichloroethane | 50.0 | 0.00 | U | 44.3 | 89 | 71-122 | 8 | 0-20 |
| 156-59-2 | PSD | cis-1,2-Dichloroethylene | 50.0 | 0.00 | U | 49.2 | 98 | 72-122 | 8 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **WST05-15-90482PSD**
**Lab Sample ID** **1203205737**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:32**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 594-20-7 | PSD | 2,2-Dichloropropane | 50.0 | 0.00 | U | 49.8 | 100 | 69-131 | 7 | 0-20 |
| 74-97-5 | PSD | Bromochloromethane | 50.0 | 0.00 | U | 57.9 | 116 | 74-123 | 6 | 0-20 |
| 67-66-3 | PSD | Chloroform | 50.0 | 0.00 | U | 53.0 | 106 | 72-123 | 7 | 0-20 |
| 71-55-6 | PSD | 1,1,1-Trichloroethane | 50.0 | 0.00 | U | 58.1 | 116 | 71-133 | 10 | 0-20 |
| 563-58-6 | PSD | 1,1-Dichloropropene | 50.0 | 0.00 | U | 45.0 | 90 | 68-125 | 10 | 0-20 |
| 56-23-5 | PSD | Carbon tetrachloride | 50.0 | 0.00 | U | 60.9 | 122 | 70-139 | 9 | 0-20 |
| 107-06-2 | PSD | 1,2-Dichloroethane | 50.0 | 0.00 | U | 55.9 | 112 | 67-123 | 4 | 0-20 |
| 71-43-2 | PSD | Benzene | 50.0 | 0.00 | U | 41.7 | 83 | 71-118 | 6 | 0-20 |
| 79-01-6 | PSD | Trichloroethylene | 50.0 | 0.00 | U | 48.2 | 96 | 68-130 | 5 | 0-20 |
| 78-87-5 | PSD | 1,2-Dichloropropane | 50.0 | 0.00 | U | 40.3 | 81 | 72-118 | 8 | 0-20 |
| 74-95-3 | PSD | Dibromomethane | 50.0 | 0.00 | U | 53.8 | 108 | 74-122 | 7 | 0-20 |
| 75-27-4 | PSD | Bromodichloromethane | 50.0 | 0.00 | U | 56.2 | 112 | 75-129 | 6 | 0-20 |
| 10061-01-5 | PSD | cis-1,3-Dichloropropylene | 50.0 | 0.00 | U | 48.5 | 97 | 73-125 | 9 | 0-20 |
| 108-88-3 | PSD | Toluene | 50.0 | 0.00 | U | 39.7 | 79 | 69-119 | 4 | 0-20 |
| 10061-02-6 | PSD | trans-1,3-Dichloropropylene | 50.0 | 0.00 | U | 46.3 | 93 | 73-125 | 3 | 0-20 |
| 79-00-5 | PSD | 1,1,2-Trichloroethane | 50.0 | 0.00 | U | 42.3 | 85 | 73-118 | 3 | 0-20 |
| 142-28-9 | PSD | 1,3-Dichloropropane | 50.0 | 0.00 | U | 41.7 | 83 | 71-116 | 0 | 0-20 |
| 127-18-4 | PSD | Tetrachloroethylene | 50.0 | 0.00 | U | 46.7 | 93 | 65-128 | 3 | 0-20 |
| 124-48-1 | PSD | Dibromochloromethane | 50.0 | 0.00 | U | 59.1 | 118 | 68-133 | 3 | 0-20 |
| 108-90-7 | PSD | Chlorobenzene | 50.0 | 0.00 | U | 42.9 | 86 | 71-119 | 4 | 0-20 |
| 100-41-4 | PSD | Ethylbenzene | 50.0 | 0.00 | U | 41.6 | 83 | 70-121 | 7 | 0-20 |
| 95-47-6 | PSD | o-Xylene | 50.0 | 0.00 | U | 41.7 | 83 | 70-123 | 3 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **WST05-15-90482PSD**
**Lab Sample ID** **1203205737**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 02:32**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 100-42-5 | PSD | Styrene | 50.0 | 0.00 | U | 41.7 | 83 | 72-127 | 3 | 0-20 |
| 75-25-2 | PSD | Bromoform | 50.0 | 0.00 | U | 60.4 | 121 | 60-133 | 1 | 0-20 |
| 98-82-8 | PSD | Isopropylbenzene | 50.0 | 0.00 | U | 39.8 | 80 | 67-127 | 3 | 0-20 |
| 79-34-5 | PSD | 1,1,2,2-Tetrachloroethane | 50.0 | 0.00 | U | 42.1 | 84 | 67-125 | 2 | 0-20 |
| 96-18-4 | PSD | 1,2,3-Trichloropropane | 50.0 | 0.00 | U | 50.3 | 101 | 68-123 | 1 | 0-20 |
| 108-86-1 | PSD | Bromobenzene | 50.0 | 0.00 | U | 44.9 | 90 | 69-120 | 2 | 0-20 |
| 103-65-1 | PSD | n-Propylbenzene | 50.0 | 0.00 | U | 36.4 | 73 | 65-125 | 9 | 0-20 |
| 108-67-8 | PSD | 1,3,5-Trimethylbenzene | 50.0 | 0.00 | U | 41.4 | 83 | 67-126 | 7 | 0-20 |
| 95-49-8 | PSD | 2-Chlorotoluene | 50.0 | 0.00 | U | 41.0 | 82 | 67-122 | 7 | 0-20 |
| 106-43-4 | PSD | 4-Chlorotoluene | 50.0 | 0.00 | U | 38.2 | 76 | 66-121 | 7 | 0-20 |
| 98-06-6 | PSD | tert-Butylbenzene | 50.0 | 0.00 | U | 43.6 | 87 | 67-130 | 7 | 0-20 |
| 95-63-6 | PSD | 1,2,4-Trimethylbenzene | 50.0 | 0.00 | U | 39.4 | 79 | 66-124 | 7 | 0-20 |
| 135-98-8 | PSD | sec-Butylbenzene | 50.0 | 0.00 | U | 41.1 | 82 | 67-128 | 8 | 0-20 |
| 99-87-6 | PSD | 4-Isopropyltoluene | 50.0 | 0.00 | U | 41.9 | 84 | 66-129 | 8 | 0-20 |
| 541-73-1 | PSD | 1,3-Dichlorobenzene | 50.0 | 0.00 | U | 41.4 | 83 | 67-120 | 2 | 0-20 |
| 106-46-7 | PSD | 1,4-Dichlorobenzene | 50.0 | 0.00 | U | 41.9 | 84 | 66-118 | 4 | 0-20 |
| 104-51-8 | PSD | n-Butylbenzene | 50.0 | 0.00 | U | 38.6 | 77 | 63-131 | 8 | 0-20 |
| 87-68-3 | PSD | Hexachlorobutadiene | 50.0 | 0.00 | U | 51.6 | 103 | 55-138 | 8 | 0-20 |
| 91-20-3 | PSD | Naphthalene | 50.0 | 0.00 | U | 49.3 | 99 | 61-131 | 3 | 0-20 |
| 87-61-6 | PSD | 1,2,3-Trichlorobenzene | 50.0 | 0.00 | U | 45.9 | 92 | 56-133 | 3 | 0-20 |
| 120-82-1 | PSD | 1,2,4-Trichlorobenzene | 50.0 | 0.00 | U | 44.9 | 90 | 56-131 | 1 | 0-20 |
| 630-20-6 | PSD | 1,1,1,2-Tetrachloroethane | 50.0 | 0.00 | U | 53.8 | 108 | 76-129 | 3 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Sample Type:** **Post Spike Duplicate**
**Client ID:** **WST05-15-90482PSD**
**Matrix:** **W**
**Lab Sample ID** **1203205737**
**Instrument:** **VOA1.I**
**Analysis Date:** **11/14/2014 02:32**
**Dilution: 1**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-50-1 | PSD | 1,2-Dichlorobenzene | 50.0 | 0.00 | U | 43.6 | 87 | 69-119 | 1 | 0-20 |
| 71-36-3 | PSD | n-Butyl alcohol | 5000 | 112 | | 4970 | 97 | 55-141 | 5 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **WST05-15-90482PS**
**Lab Sample ID** **1203205736**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 03:05**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PS | Acrolein | 250 | 0.00 | U | 196 | 78 | 48-138 |
| 76-13-1 | PS | Trichlorotrifluoroethane | 250 | 0.00 | U | 276 | 111 | 63-146 |
| 107-05-1 | PS | Allyl chloride | 250 | 0.00 | U | 214 | 85 | 61-126 |
| 107-13-1 | PS | Acrylonitrile | 250 | 0.00 | U | 217 | 87 | 62-128 |
| 107-12-0 | PS | Propionitrile | 250 | 0.00 | U | 224 | 90 | 63-133 |
| 126-98-7 | PS | Methacrylonitrile | 250 | 0.00 | U | 224 | 89 | 61-131 |
| 80-62-6 | PS | Methyl methacrylate | 250 | 0.00 | U | 253 | 101 | 69-127 |
| 97-63-2 | PS | Ethyl methacrylate | 250 | 0.00 | U | 224 | 90 | 70-126 |
| 78-83-1 | PS | Isobutyl alcohol | 2500 | 500 | | 3350 | 114 | 57-139 |
| 126-99-8 | PS | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 50.4 | 101 | 56-140 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **WST05-15-90482PSD**
**Lab Sample ID** **1203205738**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Post Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/14/2014 03:37**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-02-8 | PSD | Acrolein | 250 | 0.00 | U | 189 | 76 | 48-138 | 3 | 0-20 |
| 76-13-1 | PSD | Trichlorotrifluoroethane | 250 | 0.00 | U | 273 | 109 | 63-146 | 1 | 0-20 |
| 107-05-1 | PSD | Allyl chloride | 250 | 0.00 | U | 209 | 83 | 61-126 | 2 | 0-20 |
| 107-13-1 | PSD | Acrylonitrile | 250 | 0.00 | U | 211 | 85 | 62-128 | 3 | 0-20 |
| 107-12-0 | PSD | Propionitrile | 250 | 0.00 | U | 221 | 89 | 63-133 | 1 | 0-20 |
| 126-98-7 | PSD | Methacrylonitrile | 250 | 0.00 | U | 216 | 86 | 61-131 | 4 | 0-20 |
| 80-62-6 | PSD | Methyl methacrylate | 250 | 0.00 | U | 240 | 96 | 69-127 | 5 | 0-20 |
| 97-63-2 | PSD | Ethyl methacrylate | 250 | 0.00 | U | 212 | 85 | 70-126 | 5 | 0-20 |
| 78-83-1 | PSD | Isobutyl alcohol | 2500 | 500 | | 3230 | 109 | 57-139 | 4 | 0-20 |
| 126-99-8 | PSD | 2-Chloro-1,3-butadiene | 50.0 | 0.00 | U | 49.1 | 98 | 56-140 | 3 | 0-20 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209451**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 22:12**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 179601-23-1 | LCS | m,p-Xylenes | 100 | 0.0 | 81.0 | 81 | 78-120 |
| 75-05-8 | LCS | Acetonitrile | 1250 | 0.0 | 846 | 68 | 60-124 |
| 67-64-1 | LCS | Acetone | 250 | 0.0 | 268 | 107 | 55-147 |
| 74-88-4 | LCS | Iodomethane | 250 | 0.0 | 267 | 107 | 72-126 |
| 75-15-0 | LCS | Carbon disulfide | 250 | 0.0 | 208 | 83 | 73-135 |
| 108-05-4 | LCS | Vinyl acetate | 250 | 0.0 | 213 | 85 | 61-133 |
| 78-93-3 | LCS | 2-Butanone | 250 | 0.0 | 211 | 84 | 57-145 |
| 108-10-1 | LCS | 4-Methyl-2-pentanone | 250 | 0.0 | 182 | 73 | 67-128 |
| 591-78-6 | LCS | 2-Hexanone | 250 | 0.0 | 182 | 73 | 59-147 |
| 75-71-8 | LCS | Dichlorodifluoromethane | 50.0 | 0.0 | 54.8 | 110 | 52-134 |
| 74-87-3 | LCS | Chloromethane | 50.0 | 0.0 | 40.3 | 81 | 57-126 |
| 75-01-4 | LCS | Vinyl chloride | 50.0 | 0.0 | 44.5 | 89 | 62-126 |
| 74-83-9 | LCS | Bromomethane | 50.0 | 0.0 | 56.5 | 113 | 63-127 |
| 75-00-3 | LCS | Chloroethane | 50.0 | 0.0 | 40.5 | 81 | 69-120 |
| 75-69-4 | LCS | Trichlorofluoromethane | 50.0 | 0.0 | 59.3 | 119 | 69-129 |
| 60-29-7 | LCS | Ethyl ether | 50.0 | 0.0 | 45.6 | 91 | 72-120 |
| 75-35-4 | LCS | 1,1-Dichloroethylene | 50.0 | 0.0 | 43.6 | 87 | 70-127 |
| 75-09-2 | LCS | Methylene chloride | 50.0 | 0.0 | 41.9 | 84 | 70-120 |
| 1634-04-4 | LCS | tert-Butyl methyl ether | 50.0 | 0.0 | 51.2 | 102 | 74-120 |
| 156-60-5 | LCS | trans-1,2-Dichloroethylene | 50.0 | 0.0 | 42.2 | 84 | 73-120 |
| 75-34-3 | LCS | 1,1-Dichloroethane | 50.0 | 0.0 | 42.0 | 84 | 75-120 |
| 156-59-2 | LCS | cis-1,2-Dichloroethylene | 50.0 | 0.0 | 46.2 | 92 | 76-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209451**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 22:12**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 594-20-7 | LCS | 2,2-Dichloropropane | 50.0 | 0.0 | 50.3 | 101 | 76-131 |
| 74-97-5 | LCS | Bromochloromethane | 50.0 | 0.0 | 55.9 | 112 | 76-122 |
| 67-66-3 | LCS | Chloroform | 50.0 | 0.0 | 51.0 | 102 | 76-120 |
| 71-55-6 | LCS | 1,1,1-Trichloroethane | 50.0 | 0.0 | 56.3 | 113 | 76-131 |
| 563-58-6 | LCS | 1,1-Dichloropropene | 50.0 | 0.0 | 43.3 | 87 | 73-123 |
| 56-23-5 | LCS | Carbon tetrachloride | 50.0 | 0.0 | 58.4 | 117 | 76-135 |
| 107-06-2 | LCS | 1,2-Dichloroethane | 50.0 | 0.0 | 54.8 | 110 | 71-120 |
| 71-43-2 | LCS | Benzene | 50.0 | 0.0 | 39.9 | 80 | 75-120 |
| 79-01-6 | LCS | Trichloroethylene | 50.0 | 0.0 | 47.7 | 95 | 77-123 |
| 78-87-5 | LCS | 1,2-Dichloropropane | 50.0 | 0.0 | 38.5 | 77 | 76-120 |
| 74-95-3 | LCS | Dibromomethane | 50.0 | 0.0 | 52.8 | 106 | 77-120 |
| 75-27-4 | LCS | Bromodichloromethane | 50.0 | 0.0 | 55.3 | 111 | 78-126 |
| 10061-01-5 | LCS | cis-1,3-Dichloropropylene | 50.0 | 0.0 | 48.5 | 97 | 78-125 |
| 108-88-3 | LCS | Toluene | 50.0 | 0.0 | 38.9 | 78 | 75-120 |
| 10061-02-6 | LCS | trans-1,3-Dichloropropylene | 50.0 | 0.0 | 47.6 | 95 | 78-124 |
| 79-00-5 | LCS | 1,1,2-Trichloroethane | 50.0 | 0.0 | 41.9 | 84 | 76-120 |
| 142-28-9 | LCS | 1,3-Dichloropropane | 50.0 | 0.0 | 43.0 | 86 | 73-120 |
| 127-18-4 | LCS | Tetrachloroethylene | 50.0 | 0.0 | 48.1 | 96 | 73-125 |
| 124-48-1 | LCS | Dibromochloromethane | 50.0 | 0.0 | 58.2 | 116 | 72-131 |
| 108-90-7 | LCS | Chlorobenzene | 50.0 | 0.0 | 43.0 | 86 | 77-120 |
| 100-41-4 | LCS | Ethylbenzene | 50.0 | 0.0 | 41.9 | 84 | 77-120 |
| 95-47-6 | LCS | o-Xylene | 50.0 | 0.0 | 42.7 | 85 | 78-120 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209451**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 22:12**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 100-42-5 | LCS | Styrene | 50.0 | 0.0 | 43.4 | 87 | 79-124 |
| 75-25-2 | LCS | Bromoform | 50.0 | 0.0 | 60.8 | 122 | 65-132 |
| 98-82-8 | LCS | Isopropylbenzene | 50.0 | 0.0 | 39.9 | 80 | 76-123 |
| 79-34-5 | LCS | 1,1,2,2-Tetrachloroethane | 50.0 | 0.0 | 41.0 | 82 | 72-122 |
| 96-18-4 | LCS | 1,2,3-Trichloropropane | 50.0 | 0.0 | 48.8 | 98 | 71-120 |
| 108-86-1 | LCS | Bromobenzene | 50.0 | 0.0 | 45.5 | 91 | 76-120 |
| 103-65-1 | LCS | n-Propylbenzene | 50.0 | 0.0 | 35.0 | 70 * | 75-121 |
| 108-67-8 | LCS | 1,3,5-Trimethylbenzene | 50.0 | 0.0 | 41.2 | 82 | 77-122 |
| 95-49-8 | LCS | 2-Chlorotoluene | 50.0 | 0.0 | 41.3 | 83 | 76-120 |
| 106-43-4 | LCS | 4-Chlorotoluene | 50.0 | 0.0 | 39.5 | 79 | 76-120 |
| 98-06-6 | LCS | tert-Butylbenzene | 50.0 | 0.0 | 43.4 | 87 | 77-127 |
| 95-63-6 | LCS | 1,2,4-Trimethylbenzene | 50.0 | 0.0 | 40.4 | 81 | 77-121 |
| 135-98-8 | LCS | sec-Butylbenzene | 50.0 | 0.0 | 41.6 | 83 | 77-124 |
| 99-87-6 | LCS | 4-Isopropyltoluene | 50.0 | 0.0 | 42.3 | 85 | 77-126 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 43.8 | 88 | 76-120 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 45.0 | 90 | 76-120 |
| 104-51-8 | LCS | n-Butylbenzene | 50.0 | 0.0 | 40.2 | 80 | 76-127 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 56.3 | 113 | 69-133 |
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 53.6 | 107 | 67-129 |
| 87-61-6 | LCS | 1,2,3-Trichlorobenzene | 50.0 | 0.0 | 52.5 | 105 | 66-131 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 50.8 | 102 | 68-132 |
| 630-20-6 | LCS | 1,1,1,2-Tetrachloroethane | 50.0 | 0.0 | 53.3 | 107 | 80-126 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Sample Type:** **Laboratory Control Sample**
**Client ID:** **LCS for batch 1434601**
**Matrix:** **WATER**
**Lab Sample ID** **1203209451**
**Instrument:** **VOA1.I**
**Analysis Date:** **11/13/2014 22:12**
**Dilution: 1**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 46.3 | 93 | 77-120 |
| 71-36-3 | LCS | n-Butyl alcohol | 5000 | 0.0 | 4740 | 95 | 61-135 |

**Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1434601**
**Lab Sample ID** **1203209452**
**Instrument:** **VOA1.I**
**Analyst:** **VXY1**
**Purge Vol:** **5 mL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/13/2014 23:18**
**Dilution: 1**
**Batch ID:** **1434601**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 107-02-8 | LCS | Acrolein | 250 | 0.0 | 201 | 81 | 61-132 |
| 76-13-1 | LCS | Trichlorotrifluoroethane | 250 | 0.0 | 272 | 109 | 67-139 |
| 107-05-1 | LCS | Allyl chloride | 250 | 0.0 | 194 | 77 | 64-124 |
| 107-13-1 | LCS | Acrylonitrile | 250 | 0.0 | 208 | 83 | 68-123 |
| 107-12-0 | LCS | Propionitrile | 250 | 0.0 | 218 | 87 | 69-128 |
| 126-98-7 | LCS | Methacrylonitrile | 250 | 0.0 | 216 | 87 | 66-124 |
| 80-62-6 | LCS | Methyl methacrylate | 250 | 0.0 | 244 | 98 | 73-123 |
| 97-63-2 | LCS | Ethyl methacrylate | 250 | 0.0 | 221 | 88 | 75-122 |
| 78-83-1 | LCS | Isobutyl alcohol | 2500 | 0.0 | 2810 | 112 | 64-132 |
| 126-99-8 | LCS | 2-Chloro-1,3-butadiene | 50.0 | 0.0 | 48.9 | 98 | 60-137 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1434601** | **Instrument ID:** | **VOA1.I** | **Data File:** | **111014V1\1I109BAR.D** |
| **Lab Sample ID:** | **1203205732** | **Prep Date:** | **11/10/2014 13:10** | **Analyzed:** | **11/10/14 13:10** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1434601 | 1203205733 | 111014V1\1I104LAB.D | 11/10/14 | 1026 |
| 02 LCS for batch 1434601 | 1203205734 | 111014V1\1I107BAR.D | 11/10/14 | 1205 |
| 03 CAWR-14-89229 | 360425003 | 111014V1\1I120.D | 11/10/14 | 1912 |
| 04 CAWR-14-89222 | 360425009 | 111014V1\1I121.D | 11/10/14 | 1944 |
| 05 CAWR-14-89225 | 360425015 | 111014V1\1I122.D | 11/10/14 | 2016 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1434601** | **Instrument ID:** | **VOA1.I** | **Data File:** | **111314V1\1I428BA.D** |
| **Lab Sample ID:** | **1203209450** | **Prep Date:** | **11/13/2014 23:50** | **Analyzed:** | **11/13/14 23:50** |
| **Column:** | **DB-624** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 07 LCS for batch 1434601 | 1203209451 | 111314V1\1I425LA.D | 11/13/14 | 2212 |
| 08 LCS for batch 1434601 | 1203209452 | 111314V1\1I427LA.D | 11/13/14 | 2318 |
| 09 WST05-15-90482PS | 1203205735 | 111314V1\1I432.D | 11/14/14 | 0200 |
| 10 WST05-15-90482PSD | 1203205737 | 111314V1\1I433.D | 11/14/14 | 0232 |
| 11 WST05-15-90482PS | 1203205736 | 111314V1\1I434.D | 11/14/14 | 0305 |
| 12 WST05-15-90482PSD | 1203205738 | 111314V1\1I435.D | 11/14/14 | 0337 |

# Quality Control Data

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205732** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 13:10** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 13:10** | | | | |
| **Data File:** | **111014V1\1I109BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205732** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 13:10** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 13:10** | | | | |
| **Data File:** | **111014V1\1I109BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205732** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 13:10** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 13:10** | | | | |
| **Data File:** | **111014V1\1I109BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 49.9 | 50.0 | ug/L | 99.9 | (77%-123%) |
| Bromofluorobenzene | 43.6 | 50.0 | ug/L | 87.2 | (80%-120%) |
| Toluene-d8 | 46.6 | 50.0 | ug/L | 93.2 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205733** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 10:26** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 10:26** | | | | |
| **Data File:** | **111014V1\1I104LAB.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 58.2 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 64.0 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 46.3 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 47.4 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 50.8 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 55.0 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 52.6 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 55.1 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 50.2 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 54.3 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 48.8 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 50.6 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 55.1 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 45.3 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 50.0 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 50.4 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 46.3 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 50.4 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 61.8 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 227 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 50.8 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 206 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 47.7 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 52.7 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 209 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 258 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 991 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 48.8 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 57.3 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 55.9 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 62.4 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 56.8 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 262 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205733** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 10:26** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 10:26** | | | | |
| **Data File:** | **111014V1\1I104LAB.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 66.8 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 50.5 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 47.6 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 55.7 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 47.3 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 61.4 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 69.4 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 48.2 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 51.1 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 60.3 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 285 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 50.1 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 47.1 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 52.4 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 49.9 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 57.5 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 48.4 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 57.0 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 65.0 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 231 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 52.7 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 52.9 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 53.9 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 101 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4940 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 49.0 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 47.0 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 50.4 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 51.5 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 50.4 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 52.0 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205733** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 10:26** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 10:26** | | | | |
| **Data File:** | **111014V1\1I104LAB.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 51.4 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 54.2 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.1 | 50.0 | ug/L | 96.2 | (77%-123%) |
| Bromofluorobenzene | 42.3 | 50.0 | ug/L | 84.5 | (80%-120%) |
| Toluene-d8 | 45.0 | 50.0 | ug/L | 89.9 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205734** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 12:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 12:05** | | | | |
| **Data File:** | **111014V1\1I107BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 60.0 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 248 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 246 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 242 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205734** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 12:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 12:05** | | | | |
| **Data File:** | **111014V1\1I107BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 236 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 3090 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 243 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 263 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 253 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 333 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203205734** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 12:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/10/2014 12:05** | | | | |
| **Data File:** | **111014V1\1I107BAR.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.2 | 50.0 | ug/L | 100 | (77%-123%) |
| Bromofluorobenzene | 42.8 | 50.0 | ug/L | 85.7 | (80%-120%) |
| Toluene-d8 | 45.8 | 50.0 | ug/L | 91.6 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205735** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:00** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:00** | | | | |
| **Data File:** | **111314V1\1I432.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 52.4 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 52.7 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 41.5 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 40.9 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 41.1 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 41.5 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 40.8 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 44.6 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 50.7 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 44.7 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 36.8 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 43.0 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 53.7 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 37.1 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 38.7 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 40.7 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 41.9 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 40.1 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 46.5 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 169 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 38.1 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 139 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 35.6 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 38.8 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 182 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 336 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 812 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 39.2 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 44.2 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 54.6 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 59.7 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 48.3 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 198 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205735** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:00** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:00** | | | | |
| **Data File:** | **111314V1\1I432.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 55.8 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 41.2 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 35.4 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 49.5 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 34.9 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 57.3 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 50.3 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 45.0 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 41.0 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 38.8 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 47.8 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 264 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 38.6 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 40.6 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 48.1 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 40.5 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 45.3 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 38.3 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 46.0 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 52.5 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 170 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 38.2 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 45.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 44.3 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 79.3 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4710 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 35.7 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 33.4 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 40.3 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 37.9 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 45.2 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 40.5 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205735** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:00** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:00** | | | | |
| **Data File:** | **111314V1\1I432.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 40.7 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 44.7 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 49.7 | 50.0 | ug/L | 99.3 | (77%-123%) |
| Bromofluorobenzene | 43.3 | 50.0 | ug/L | 86.6 | (80%-120%) |
| Toluene-d8 | 44.3 | 50.0 | ug/L | 88.6 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205736** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:05** | | | | |
| **Data File:** | **111314V1\1I434.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 50.4 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 196 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 217 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 214 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205736** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:05** | | | | |
| **Data File:** | **111314V1\1I434.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 224 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 3350 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 224 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 253 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 224 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 276 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205736** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PS** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:05** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:05** | | | | |
| **Data File:** | **111314V1\1I434.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 49.0 | 50.0 | ug/L | 97.9 | (77%-123%) |
| Bromofluorobenzene | 43.9 | 50.0 | ug/L | 87.7 | (80%-120%) |
| Toluene-d8 | 44.2 | 50.0 | ug/L | 88.3 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205737** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:32** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:32** | | | | |
| **Data File:** | **111314V1\1I433.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 53.8 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 58.1 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 42.1 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 42.3 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 44.3 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 44.5 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 45.0 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 45.9 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 50.3 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 44.9 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 39.4 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 43.6 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 55.9 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 40.3 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 41.4 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 41.4 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 41.7 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 41.9 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 49.8 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 184 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 41.0 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 136 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 38.2 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 41.9 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 182 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 365 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 894 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 41.7 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 44.9 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 57.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 56.2 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 60.4 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 50.8 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 216 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205737** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:32** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:32** | | | | |
| **Data File:** | **111314V1\1I433.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 60.9 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 42.9 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 37.6 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 53.0 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 36.0 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 59.1 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 53.8 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 44.5 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 44.0 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 41.6 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 51.6 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 284 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 39.8 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 43.4 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 49.3 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 41.7 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 46.7 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 39.7 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 48.2 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 53.1 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 182 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 38.7 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 49.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 48.5 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 82.2 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4970 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 38.6 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 36.4 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 41.7 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 41.1 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 48.6 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 43.6 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205737** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 02:32** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 02:32** | | | | |
| **Data File:** | **111314V1\1I433.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 43.3 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 46.3 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 53.3 | 50.0 | ug/L | 107 | (77%-123%) |
| Bromofluorobenzene | 43.4 | 50.0 | ug/L | 86.9 | (80%-120%) |
| Toluene-d8 | 44.7 | 50.0 | ug/L | 89.4 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205738** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:37** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:37** | | | | |
| **Data File:** | **111314V1\1I435.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 49.1 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 189 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 211 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 209 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205738** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:37** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:37** | | | | |
| **Data File:** | **111314V1\1I435.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 212 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 3230 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 216 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 240 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 221 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 273 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **11/05/2014 14:30** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203205738** | **Date Received:** | **11/07/2014 09:00** | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **WST05-15-90482PSD** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/14/2014 03:37** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/14/2014 03:37** | | | | |
| **Data File:** | **111314V1\1I435.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 48.6 | 50.0 | ug/L | 97.2 | (77%-123%) |
| Bromofluorobenzene | 43.4 | 50.0 | ug/L | 86.9 | (80%-120%) |
| Toluene-d8 | 43.8 | 50.0 | ug/L | 87.5 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209450** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:50** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:50** | | | | |
| **Data File:** | **111314V1\1I428BA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209450** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:50** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:50** | | | | |
| **Data File:** | **111314V1\1I428BA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209450** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:50** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:50** | | | | |
| **Data File:** | **111314V1\1I428BA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 51.8 | 50.0 | ug/L | 104 | (77%-123%) |
| Bromofluorobenzene | 43.5 | 50.0 | ug/L | 87.1 | (80%-120%) |
| Toluene-d8 | 44.5 | 50.0 | ug/L | 89.0 | (80%-120%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | | ug/L | | |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209451** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 22:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 22:12** | | | | |
| **Data File:** | **111314V1\1I425LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | | 53.3 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | | 56.3 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | | 41.0 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | | 41.9 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | | 42.0 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | | 43.6 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | | 43.3 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | | 52.5 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | | 48.8 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 50.8 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 40.4 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | | 46.3 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | | 54.8 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | | 38.5 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 41.2 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | | 43.8 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | | 43.0 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | | 45.0 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | | 50.3 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | | 211 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | | 41.3 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | | 182 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | | 39.5 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | | 42.3 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | | 182 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | | 268 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | | 846 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | U | 5.00 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | | 39.9 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | | 45.5 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | | 55.9 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | | 55.3 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | | 60.8 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | | 56.5 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | | 208 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209451** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 22:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 22:12** | | | | |
| **Data File:** | **111314V1\1I425LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | | 58.4 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | | 43.0 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | | 40.5 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | | 51.0 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | | 40.3 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | | 58.2 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | | 52.8 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | | 54.8 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | | 45.6 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | | 41.9 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | | 56.3 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | | 267 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | | 39.9 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | | 41.9 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | | 53.6 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | U | 5.00 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | | 43.4 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | | 48.1 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | | 38.9 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | | 47.7 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | | 59.3 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | | 213 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | | 44.5 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | | 46.2 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | | 48.5 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | | 81.0 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | | 4740 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | | 40.2 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | | 35.0 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | | 42.7 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | | 41.6 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | | 51.2 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | | 43.4 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209451** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 22:12** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 22:12** | | | | |
| **Data File:** | **111314V1\1I425LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | | 42.2 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | | 47.6 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.3 | 50.0 | ug/L | 105 | (77%-123%) |
| Bromofluorobenzene | 43.1 | 50.0 | ug/L | 86.1 | (80%-120%) |
| Toluene-d8 | 44.0 | 50.0 | ug/L | 87.9 | (80%-120%) |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209452** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:18** | | | | |
| **Data File:** | **111314V1\1I427LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | U | 5.00 | ug/L | 2.00 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | | 48.9 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | U | 5.00 | ug/L | 2.20 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | U | 5.00 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | U | 10.0 | ug/L | 2.50 | 10.0 |
| 75-05-8 | Acetonitrile | U | 25.0 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | | 201 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | | 208 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | | 194 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-83-9 | Bromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | U | 5.00 | ug/L | 1.50 | 5.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209452** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:18** | | | | |
| **Data File:** | **111314V1\1I427LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 56-23-5 | Carbon tetrachloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | | 221 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | U | 5.00 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | | 2810 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | | 216 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | | 244 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | U | 10.0 | ug/L | 1.70 | 10.0 |
| 91-20-3 | Naphthalene | U | 1.00 | ug/L | 0.600 | 1.00 |
| 107-12-0 | Propionitrile | | 218 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | U | 1.00 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | | 272 | ug/L | 1.50 | 5.00 |
| 108-05-4 | Vinyl acetate | U | 5.00 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | U | 1.00 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | U | 2.00 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | U | 50.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 1634-04-4 | tert-Butyl methyl ether | U | 1.00 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | U | 1.00 | ug/L | 0.300 | 1.00 |

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203209452** | | | | |
| **Client Sample:** | **QC for batch 1434601** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1434601** | **Method:** | **SW846 8260B DOE-AL** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1434601** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **11/13/2014 23:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **11/13/2014 23:18** | | | | |
| **Data File:** | **111314V1\1I427LA.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 156-60-5 | trans-1,2-Dichloroethylene | U | 1.00 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | U | 1.00 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 51.1 | 50.0 | ug/L | 102 | (77%-123%) |
| Bromofluorobenzene | 42.7 | 50.0 | ug/L | 85.3 | (80%-120%) |
| Toluene-d8 | 44.0 | 50.0 | ug/L | 88.1 | (80%-120%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 15-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| VOA GC/MS | SW846 8260B DOE-AL | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1434601 | See Below | | |

**Potentially affected work order(s)(SDG):** **360220(2015-187),360285(2015-188),360424(2015-204),360425(2015-207),360431(2015-208),360697(2015-222),360759(2015-237)**

**Application Issues:**

Failed Recovery for LCS/LCSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. QC sample 1203205733LCS has unacceptable spike recoveries for Trichlorofluoromethane (130%, limits 69.00%-129.00%), and Dichlorodifluoromethane (139%, limits 52.00%-134.00%).<br><br>QC sample 1203205744LCS has unacceptable spike recovery for Carbon tetrachloride (136%, limits 76.00%-135.00%).<br><br>QC sample 1203209451LCS has unacceptable spike recovery for n-Propylbenzene (69.9%, limits 75.00%-121.00%). | 1. The LCS recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. |

**Originator's Name:**

Vanny Yib 15-NOV-14

**Data Validator/Group Leader:**

Kelle Bellamy 19-NOV-14

# Semi-Volatile Analysis

# Case Narrative

**Semi-Volatile Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry** |
| Analytical Method: | SW846 3510C/8270D |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1433727 |
| Prep Batch Number: | 1433726 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203203425 | MB for batch 1433726 |
| 1203203426 | Laboratory Control Sample (LCS) |
| 1203203427 | 360431003(CAPA-14-87204) Matrix Spike (MS) |
| 1203203428 | 360431003(CAPA-14-87204) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 33.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in

the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

**CCV Requirements**
All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. Detected concentrations of these analytes should be considered as estimated.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG in this batch met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Sample 360431003 (CAPA-14-87204) was selected for analysis as the matrix spike and matrix spike duplicate.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPD value between the MS and MSD, 1203203427 (CAPA-14-87204MS) and 1203203428 (CAPA-14-87204MSD), for 2,4-Dinitrophenol was not within the 0-30% limits. Please see the QC Summary/Spike Recovery Report for the specific value. Since 2,4-Dinitrophenol was individually within the acceptance criteria for the MS and MSD, the non-conformance had no adverse impact on the data. The LCS passed recovery for this analyte. The results are reported.

**Internal Standard (ISTD) Acceptance**
The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception report 1353363 was generated for the samples in this batch for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

**TIC Comment**
Tentatively identified compounds (TIC) may be requested for the 1203203425(MB) and samples 360425003 (CAWR-14-89229) and 360425009 (CAWR-14-89222) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| MSD5.I | Agilent 6890/5973 GC/MS w/ 7683 Autosampler | HP6890/HP5973 | DB-5MS | 25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207 GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

E Concentration of the target analyte exceeds the instrument calibration range

J Value is estimated

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey **Name: Barbara Bailey**

**Date: 25 NOV 2014** **Title: Data Validator**

# Sample Data Summary

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425003** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 20:29** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0611.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 122-66-7 | Azobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 123-91-1 | 1,4-Dioxane | U | 10.9 | ug/L | 3.26 | 10.9 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 51-28-5 | 2,4-Dinitrophenol | U | 21.7 | ug/L | 5.43 | 21.7 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.09 | ug/L | 0.446 | 1.09 |
| 95-57-8 | 2-Chlorophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 88-75-5 | 2-Nitrophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.9 | ug/L | 3.26 | 10.9 |
| 59-50-7 | Parachlorometa cresol | U | 10.9 | ug/L | 3.26 | 10.9 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.9 | ug/L | 3.59 | 10.9 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.9 | ug/L | 3.26 | 10.9 |
| 100-02-7 | 4-Nitrophenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 62-53-3 | Aniline | U | 10.9 | ug/L | 4.57 | 10.9 |
| 1912-24-9 | Atrazine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 92-87-5 | Benzidine | U | 10.9 | ug/L | 4.24 | 10.9 |
| 65-85-0 | Benzoic acid | U | 21.7 | ug/L | 6.52 | 21.7 |
| 100-51-6 | Benzyl alcohol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 85-68-7 | Butylbenzylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 84-74-2 | Di-n-butylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 117-84-0 | Di-n-octylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 132-64-9 | Dibenzofuran | U | 10.9 | ug/L | 3.26 | 10.9 |
| 84-66-2 | Diethylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 131-11-3 | Dimethylphthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 88-85-7 | Dinoseb | U | 10.9 | ug/L | 3.26 | 10.9 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425003** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 20:29** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0611.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 118-74-1 | Hexachlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 87-68-3 | Hexachlorobutadiene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 67-72-1 | Hexachloroethane | U | 10.9 | ug/L | 3.26 | 10.9 |
| 78-59-1 | Isophorone | U | 10.9 | ug/L | 3.80 | 10.9 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.9 | ug/L | 3.26 | 10.9 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 98-95-3 | Nitrobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 608-93-5 | Pentachlorobenzene | U | 10.9 | ug/L | 3.26 | 10.9 |
| 108-95-2 | Phenol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 110-86-1 | Pyridine | U | 10.9 | ug/L | 3.26 | 10.9 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.9 | ug/L | 3.26 | 10.9 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.9 | ug/L | 3.26 | 10.9 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.9 | ug/L | 3.26 | 10.9 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.9 | ug/L | 3.26 | 10.9 |
| 65794-96-9 | m,p-Cresols | U | 10.9 | ug/L | 4.02 | 10.9 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.9 | ug/L | 3.26 | 10.9 |
| 95-48-7 | o-Cresol | U | 10.9 | ug/L | 3.26 | 10.9 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.9 | ug/L | 3.26 | 10.9 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.9 | ug/L | 3.26 | 10.9 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 83.7 | 109 | ug/L | 77.0 | (33%-126%) |
| 2-Fluorobiphenyl | 42.0 | 54.3 | ug/L | 77.3 | (35%-102%) |
| 2-Fluorophenol | 48.3 | 109 | ug/L | 44.5 | (18%-84%) |
| Nitrobenzene-d5 | 43.1 | 54.3 | ug/L | 79.3 | (38%-113%) |
| Phenol-d5 | 31.2 | 109 | ug/L | 28.7 | (10%-110%) |
| p-Terphenyl-d14 | 55.6 | 54.3 | ug/L | 102 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.201 | 9.9 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425003** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 20:29** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0611.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 20.487 | 5.86 | ug/L | 0 | J |
| | unknown | 22.716 | 28.3 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425009** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 21:01** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0612.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 122-66-7 | Azobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 123-91-1 | 1,4-Dioxane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.8 | ug/L | 5.21 | 20.8 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.04 | ug/L | 0.427 | 1.04 |
| 95-57-8 | 2-Chlorophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-75-5 | 2-Nitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 59-50-7 | Parachlorometa cresol | U | 10.4 | ug/L | 3.13 | 10.4 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.4 | ug/L | 3.44 | 10.4 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 100-02-7 | 4-Nitrophenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 62-53-3 | Aniline | U | 10.4 | ug/L | 4.38 | 10.4 |
| 1912-24-9 | Atrazine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 92-87-5 | Benzidine | U | 10.4 | ug/L | 4.06 | 10.4 |
| 65-85-0 | Benzoic acid | U | 20.8 | ug/L | 6.25 | 20.8 |
| 100-51-6 | Benzyl alcohol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 85-68-7 | Butylbenzylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 84-74-2 | Di-n-butylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 117-84-0 | Di-n-octylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 132-64-9 | Dibenzofuran | U | 10.4 | ug/L | 3.13 | 10.4 |
| 84-66-2 | Diethylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 131-11-3 | Dimethylphthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-85-7 | Dinoseb | U | 10.4 | ug/L | 3.13 | 10.4 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425009** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 21:01** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0612.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 118-74-1 | Hexachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 87-68-3 | Hexachlorobutadiene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 67-72-1 | Hexachloroethane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 78-59-1 | Isophorone | U | 10.4 | ug/L | 3.65 | 10.4 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 98-95-3 | Nitrobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 608-93-5 | Pentachlorobenzene | U | 10.4 | ug/L | 3.13 | 10.4 |
| 108-95-2 | Phenol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 110-86-1 | Pyridine | U | 10.4 | ug/L | 3.13 | 10.4 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.4 | ug/L | 3.13 | 10.4 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.4 | ug/L | 3.13 | 10.4 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.4 | ug/L | 3.13 | 10.4 |
| 65794-96-9 | m,p-Cresols | U | 10.4 | ug/L | 3.85 | 10.4 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 95-48-7 | o-Cresol | U | 10.4 | ug/L | 3.13 | 10.4 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.4 | ug/L | 3.13 | 10.4 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 79.1 | 104 | ug/L | 75.9 | (33%-126%) |
| 2-Fluorobiphenyl | 38.9 | 52.1 | ug/L | 74.6 | (35%-102%) |
| 2-Fluorophenol | 43.9 | 104 | ug/L | 42.2 | (18%-84%) |
| Nitrobenzene-d5 | 39.4 | 52.1 | ug/L | 75.6 | (38%-113%) |
| Phenol-d5 | 27.6 | 104 | ug/L | 26.5 | (10%-110%) |
| p-Terphenyl-d14 | 48.2 | 52.1 | ug/L | 92.5 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 2.201 | 7.73 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425009** | **Date Received:** | **11/04/2014 09:10** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 21:01** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0612.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 22.721 | 14.4 | ug/L | 0 | J |

# Quality Control Summary

**Semi-Volatile**

## Surrogate Recovery Report

**SDG Number: 2015-207**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 2FP %REC | PHL %REC | NBZ %REC | FBP %REC | TBP %REC | TPH %REC |
|---|---|---|---|---|---|---|---|
| 1203203425 | MB for batch 1433726 | 49 | 31 | 87 | 87 | 75 | 97 |
| 1203203426 | LCS for batch 1433726 | 52 | 34 | 92 | 85 | 93 | 84 |
| 360425003 | CAWR-14-89229 | 44 | 29 | 79 | 77 | 77 | 102 |
| 360425009 | CAWR-14-89222 | 42 | 26 | 76 | 75 | 76 | 92 |
| 1203203427 | CAPA-14-87204MS | 65 | 52 | 86 | 85 | 83 | 78 |
| 1203203428 | CAPA-14-87204MSD | 71 | 58 | 91 | 88 | 93 | 75 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 2FP | = 2-Fluorophenol | (18%-84%) |
| PHL | = Phenol-d5 | (10%-110%) |
| NBZ | = Nitrobenzene-d5 | (38%-113%) |
| FBP | = 2-Fluorobiphenyl | (35%-102%) |
| TBP | = 2,4,6-Tribromophenol | (33%-126%) |
| TPH | = p-Terphenyl-d14 | (38%-123%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1433726**
**Lab Sample ID** **1203203426**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/06/2014 18:55**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 62-75-9 | LCS | N-Methyl-N-nitrosomethylam | 50.0 | 0.0 | 34.1 | 68 | 24-82 |
| 110-86-1 | LCS | Pyridine | 50.0 | 0.0 | 38.7 | 77 | 24-97 |
| 62-53-3 | LCS | Aniline | 50.0 | 0.0 | 49.3 | 99 | 42-120 |
| 108-95-2 | LCS | Phenol | 50.0 | 0.0 | 18.2 | 36 | 10-114 |
| 111-44-4 | LCS | bis(2-Chloroethyl) ether | 50.0 | 0.0 | 45.9 | 92 | 44-111 |
| 95-57-8 | LCS | 2-Chlorophenol | 50.0 | 0.0 | 41.4 | 83 | 44-103 |
| 541-73-1 | LCS | 1,3-Dichlorobenzene | 50.0 | 0.0 | 33.6 | 67 | 27-91 |
| 106-46-7 | LCS | 1,4-Dichlorobenzene | 50.0 | 0.0 | 36.1 | 72 | 27-93 |
| 95-50-1 | LCS | 1,2-Dichlorobenzene | 50.0 | 0.0 | 35.5 | 71 | 29-92 |
| 108-60-1 | LCS | bis(2-Chloro-1-methylethyl)et | 50.0 | 0.0 | 43.1 | 86 | 30-113 |
| 100-51-6 | LCS | Benzyl alcohol | 50.0 | 0.0 | 42.0 | 84 | 34-106 |
| 95-48-7 | LCS | o-Cresol | 50.0 | 0.0 | 38.9 | 78 | 36-99 |
| 65794-96-9 | LCS | m,p-Cresols | 50.0 | 0.0 | 41.1 | 82 | 34-106 |
| 621-64-7 | LCS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 50.0 | 0.0 | 46.1 | 92 | 48-119 |
| 67-72-1 | LCS | Hexachloroethane | 50.0 | 0.0 | 33.2 | 66 | 25-92 |
| 98-95-3 | LCS | Nitrobenzene | 50.0 | 0.0 | 45.4 | 91 | 44-117 |
| 78-59-1 | LCS | Isophorone | 50.0 | 0.0 | 46.1 | 92 | 49-124 |
| 88-75-5 | LCS | 2-Nitrophenol | 50.0 | 0.0 | 44.4 | 89 | 47-110 |
| 105-67-9 | LCS | 2,4-Dimethylphenol | 50.0 | 0.0 | 40.9 | 82 | 43-105 |
| 111-91-1 | LCS | bis(2-Chloroethoxy)methane | 50.0 | 0.0 | 47.2 | 94 | 48-114 |
| 120-83-2 | LCS | 2,4-Dichlorophenol | 50.0 | 0.0 | 41.7 | 83 | 47-107 |
| 65-85-0 | LCS | Benzoic acid | 100 | 0.0 | 16.3 | 16 | 10-91 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1433726**
**Lab Sample ID** **1203203426**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/06/2014 18:55**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-47-8 | LCS | 4-Chloroaniline | 50.0 | 0.0 | 48.9 | 98 | 48-120 |
| 87-68-3 | LCS | Hexachlorobutadiene | 50.0 | 0.0 | 33.0 | 66 | 24-93 |
| 59-50-7 | LCS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 50.0 | 0.0 | 45.3 | 91 | 47-113 |
| 77-47-4 | LCS | Hexachlorocyclopentadiene | 50.0 | 0.0 | 24.8 | 50 | 18-87 |
| 88-06-2 | LCS | 2,4,6-Trichlorophenol | 50.0 | 0.0 | 44.1 | 88 | 48-114 |
| 95-95-4 | LCS | 2,4,5-Trichlorophenol | 50.0 | 0.0 | 44.3 | 89 | 50-113 |
| 91-58-7 | LCS | 2-Chloronaphthalene | 50.0 | 0.0 | 40.4 | 81 | 37-100 |
| 88-74-4 | LCS | 2-Nitroaniline<br>*o-Nitroaniline* | 50.0 | 0.0 | 50.5 | 101 | 50-123 |
| 99-09-2 | LCS | 3-Nitroaniline<br>*m-Nitroaniline* | 50.0 | 0.0 | 53.3 | 107 | 48-126 |
| 131-11-3 | LCS | Dimethylphthalate | 50.0 | 0.0 | 49.5 | 99 | 55-119 |
| 606-20-2 | LCS | 2,6-Dinitrotoluene | 50.0 | 0.0 | 47.4 | 95 | 55-117 |
| 121-14-2 | LCS | 2,4-Dinitrotoluene | 50.0 | 0.0 | 50.4 | 101 | 55-123 |
| 51-28-5 | LCS | 2,4-Dinitrophenol | 50.0 | 0.0 | 29.0 | 58 | 14-126 |
| 132-64-9 | LCS | Dibenzofuran | 50.0 | 0.0 | 47.9 | 96 | 46-111 |
| 58-90-2 | LCS | 2,3,4,6-Tetrachlorophenol | 50.0 | 0.0 | 45.1 | 90 | 48-117 |
| 84-66-2 | LCS | Diethylphthalate | 50.0 | 0.0 | 49.1 | 98 | 55-121 |
| 100-02-7 | LCS | 4-Nitrophenol | 50.0 | 0.0 | 17.8 | 36 | 15-109 |
| 7005-72-3 | LCS | 4-Chlorophenylphenylether | 50.0 | 0.0 | 46.3 | 93 | 44-112 |
| 100-01-6 | LCS | 4-Nitroaniline<br>*p-Nitroaniline* | 50.0 | 0.0 | 65.3 | 131 | 46-144 |
| 534-52-1 | LCS | 2-Methyl-4,6-dinitrophenol | 50.0 | 0.0 | 40.0 | 80 | 41-123 |
| 122-39-4 | LCS | Diphenylamine | 50.0 | 0.0 | 47.0 | 94 | 51-111 |
| 122-66-7 | LCS | Azobenzene<br>*1,2-Diphenylhydrazine* | 50.0 | 0.0 | 46.7 | 93 | 43-114 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1433726**
**Lab Sample ID** **1203203426**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/06/2014 18:55**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 101-55-3 | LCS | 4-Bromophenylphenylether | 50.0 | 0.0 | 44.9 | 90 | 46-112 |
| 118-74-1 | LCS | Hexachlorobenzene | 50.0 | 0.0 | 43.1 | 86 | 46-113 |
| 84-74-2 | LCS | Di-n-butylphthalate | 50.0 | 0.0 | 50.2 | 100 | 52-119 |
| 85-68-7 | LCS | Butylbenzylphthalate | 50.0 | 0.0 | 50.3 | 101 | 45-121 |
| 117-81-7 | LCS | bis(2-Ethylhexyl)phthalate | 50.0 | 0.0 | 56.0 | 112 | 43-120 |
| 117-84-0 | LCS | Di-n-octylphthalate | 50.0 | 0.0 | 61.0 | 122 | 40-122 |
| 123-91-1 | LCS | 1,4-Dioxane | 50.0 | 0.0 | 32.3 | 65 | 29-74 |
| 930-55-2 | LCS | N-Nitrosopyrrolidine | 50.0 | 0.0 | 46.3 | 93 | 46-111 |
| 95-94-3 | LCS | 1,2,4,5-Tetrachlorobenzene | 50.0 | 0.0 | 36.9 | 74 | 33-94 |
| 1912-24-9 | LCS | Atrazine | 50.0 | 0.0 | 56.1 | 112 | 30-122 |
| 92-87-5 | LCS | Benzidine | 100 | 0.0 | 117 | 117 | 10-137 |
| 91-94-1 | LCS | 3,3'-Dichlorobenzidine | 50.0 | 0.0 | 55.3 | 111 | 37-119 |
| 120-82-1 | LCS | 1,2,4-Trichlorobenzene | 50.0 | 0.0 | 35.5 | 71 | 29-93 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87204MS**
**Lab Sample ID** **1203203427**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/06/2014 22:03**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MS | N-Methyl-N-nitrosomethylam | 122 | 0.00 | U | 107 | 88 | 26-97 |
| 110-86-1 | MS | Pyridine | 122 | 0.00 | U | 113 | 93 | 20-112 |
| 62-53-3 | MS | Aniline | 122 | 0.00 | U | 119 | 98 | 28-126 |
| 108-95-2 | MS | Phenol | 122 | 0.00 | U | 69.0 | 57 | 17-77 |
| 111-44-4 | MS | bis(2-Chloroethyl) ether | 122 | 0.00 | U | 110 | 90 | 37-113 |
| 95-57-8 | MS | 2-Chlorophenol | 122 | 0.00 | U | 98.3 | 81 | 34-108 |
| 541-73-1 | MS | 1,3-Dichlorobenzene | 122 | 0.00 | U | 82.0 | 67 | 25-89 |
| 106-46-7 | MS | 1,4-Dichlorobenzene | 122 | 0.00 | U | 86.2 | 71 | 26-90 |
| 95-50-1 | MS | 1,2-Dichlorobenzene | 122 | 0.00 | U | 84.7 | 69 | 26-92 |
| 108-60-1 | MS | bis(2-Chloro-1-methylethyl)et | 122 | 0.00 | U | 102 | 83 | 26-114 |
| 100-51-6 | MS | Benzyl alcohol | 122 | 0.00 | U | 107 | 88 | 28-119 |
| 95-48-7 | MS | o-Cresol | 122 | 0.00 | U | 99.5 | 82 | 30-108 |
| 65794-96-9 | MS | m,p-Cresols | 122 | 0.00 | U | 109 | 89 | 31-119 |
| 621-64-7 | MS | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 122 | 0.00 | U | 109 | 90 | 40-122 |
| 67-72-1 | MS | Hexachloroethane | 122 | 0.00 | U | 80.9 | 66 | 23-89 |
| 98-95-3 | MS | Nitrobenzene | 122 | 0.00 | U | 104 | 85 | 38-123 |
| 78-59-1 | MS | Isophorone | 122 | 0.00 | U | 106 | 87 | 40-127 |
| 88-75-5 | MS | 2-Nitrophenol | 122 | 0.00 | U | 98.4 | 81 | 35-116 |
| 105-67-9 | MS | 2,4-Dimethylphenol | 122 | 0.00 | U | 92.4 | 76 | 34-109 |
| 111-91-1 | MS | bis(2-Chloroethoxy)methane | 122 | 0.00 | U | 108 | 89 | 41-116 |
| 120-83-2 | MS | 2,4-Dichlorophenol | 122 | 0.00 | U | 95.0 | 78 | 35-113 |
| 65-85-0 | MS | Benzoic acid | 244 | 0.00 | U | 70.5 | 29 | 12-94 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87204MS**
**Lab Sample ID** **1203203427**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/06/2014 22:03**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MS | 4-Chloroaniline | 122 | 0.00 | U | 109 | 89 | 32-122 |
| 87-68-3 | MS | Hexachlorobutadiene | 122 | 0.00 | U | 77.9 | 64 | 23-90 |
| 59-50-7 | MS | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 122 | 0.00 | U | 98.8 | 81 | 37-119 |
| 77-47-4 | MS | Hexachlorocyclopentadiene | 122 | 0.00 | U | 55.2 | 45 | 10-84 |
| 88-06-2 | MS | 2,4,6-Trichlorophenol | 122 | 0.00 | U | 103 | 85 | 36-120 |
| 95-95-4 | MS | 2,4,5-Trichlorophenol | 122 | 0.00 | U | 103 | 85 | 37-121 |
| 91-58-7 | MS | 2-Chloronaphthalene | 122 | 0.00 | U | 96.9 | 79 | 32-103 |
| 88-74-4 | MS | 2-Nitroaniline<br>*o-Nitroaniline* | 122 | 0.00 | U | 111 | 91 | 38-126 |
| 99-09-2 | MS | 3-Nitroaniline<br>*m-Nitroaniline* | 122 | 0.00 | U | 112 | 92 | 30-131 |
| 131-11-3 | MS | Dimethylphthalate | 122 | 0.00 | U | 115 | 94 | 45-121 |
| 606-20-2 | MS | 2,6-Dinitrotoluene | 122 | 0.00 | U | 106 | 87 | 44-120 |
| 121-14-2 | MS | 2,4-Dinitrotoluene | 122 | 0.00 | U | 111 | 91 | 44-127 |
| 51-28-5 | MS | 2,4-Dinitrophenol | 122 | 0.00 | U | 56.5 | 46 | 10-133 |
| 132-64-9 | MS | Dibenzofuran | 122 | 0.00 | U | 111 | 91 | 39-114 |
| 58-90-2 | MS | 2,3,4,6-Tetrachlorophenol | 122 | 0.00 | U | 96.7 | 79 | 34-125 |
| 84-66-2 | MS | Diethylphthalate | 122 | 0.00 | U | 114 | 94 | 44-124 |
| 100-02-7 | MS | 4-Nitrophenol | 122 | 0.00 | U | 61.5 | 50 | 10-83 |
| 7005-72-3 | MS | 4-Chlorophenylphenylether | 122 | 0.00 | U | 107 | 88 | 37-112 |
| 100-01-6 | MS | 4-Nitroaniline<br>*p-Nitroaniline* | 122 | 0.00 | U | 127 | 104 | 27-149 |
| 534-52-1 | MS | 2-Methyl-4,6-dinitrophenol | 122 | 0.00 | U | 85.3 | 70 | 28-131 |
| 122-39-4 | MS | Diphenylamine | 122 | 0.00 | U | 110 | 90 | 34-117 |
| 122-66-7 | MS | Azobenzene<br>*1,2-Diphenylhydrazine* | 122 | 0.00 | U | 111 | 91 | 36-115 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87204MS**
**Lab Sample ID** **1203203427**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/06/2014 22:03**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MS | 4-Bromophenylphenylether | 122 | 0.00 | U | 107 | 88 | 39-112 |
| 118-74-1 | MS | Hexachlorobenzene | 122 | 0.00 | U | 105 | 86 | 39-114 |
| 84-74-2 | MS | Di-n-butylphthalate | 122 | 0.00 | U | 118 | 96 | 40-122 |
| 85-68-7 | MS | Butylbenzylphthalate | 122 | 0.00 | U | 115 | 95 | 36-124 |
| 117-81-7 | MS | bis(2-Ethylhexyl)phthalate | 122 | 0.00 | U | 126 | 103 | 35-123 |
| 117-84-0 | MS | Di-n-octylphthalate | 122 | 0.00 | U | 135 | 111 | 32-124 |
| 123-91-1 | MS | 1,4-Dioxane | 122 | 0.00 | U | 95.3 | 78 | 27-94 |
| 930-55-2 | MS | N-Nitrosopyrrolidine | 122 | 0.00 | U | 112 | 92 | 43-117 |
| 95-94-3 | MS | 1,2,4,5-Tetrachlorobenzene | 122 | 0.00 | U | 91.0 | 75 | 28-96 |
| 1912-24-9 | MS | Atrazine | 122 | 0.00 | U | 132 | 109 | 18-119 |
| 92-87-5 | MS | Benzidine | 244 | 0.00 | U | 249 | 102 | 10-127 |
| 91-94-1 | MS | 3,3'-Dichlorobenzidine | 122 | 0.00 | U | 121 | 99 | 19-120 |
| 120-82-1 | MS | 1,2,4-Trichlorobenzene | 122 | 0.00 | U | 83.6 | 69 | 26-92 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87204MSD**
**Lab Sample ID** **1203203428**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/06/2014 22:34**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 62-75-9 | MSD | N-Methyl-N-nitrosomethylam | 122 | 0.00 | U | 115 | 94 | 26-97 | 7 | 0-30 |
| 110-86-1 | MSD | Pyridine | 122 | 0.00 | U | 120 | 98 | 20-112 | 6 | 0-30 |
| 62-53-3 | MSD | Aniline | 122 | 0.00 | U | 128 | 105 | 28-126 | 7 | 0-30 |
| 108-95-2 | MSD | Phenol | 122 | 0.00 | U | 75.7 | 62 | 17-77 | 9 | 0-30 |
| 111-44-4 | MSD | bis(2-Chloroethyl) ether | 122 | 0.00 | U | 118 | 96 | 37-113 | 7 | 0-30 |
| 95-57-8 | MSD | 2-Chlorophenol | 122 | 0.00 | U | 107 | 88 | 34-108 | 8 | 0-30 |
| 541-73-1 | MSD | 1,3-Dichlorobenzene | 122 | 0.00 | U | 87.1 | 71 | 25-89 | 6 | 0-30 |
| 106-46-7 | MSD | 1,4-Dichlorobenzene | 122 | 0.00 | U | 94.3 | 77 | 26-90 | 9 | 0-30 |
| 95-50-1 | MSD | 1,2-Dichlorobenzene | 122 | 0.00 | U | 91.9 | 75 | 26-92 | 8 | 0-30 |
| 108-60-1 | MSD | bis(2-Chloro-1-methylethyl)et | 122 | 0.00 | U | 110 | 90 | 26-114 | 7 | 0-30 |
| 100-51-6 | MSD | Benzyl alcohol | 122 | 0.00 | U | 116 | 96 | 28-119 | 8 | 0-30 |
| 95-48-7 | MSD | o-Cresol | 122 | 0.00 | U | 108 | 89 | 30-108 | 8 | 0-30 |
| 65794-96-9 | MSD | m,p-Cresols | 122 | 0.00 | U | 119 | 97 | 31-119 | 9 | 0-30 |
| 621-64-7 | MSD | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | 122 | 0.00 | U | 115 | 94 | 40-122 | 5 | 0-30 |
| 67-72-1 | MSD | Hexachloroethane | 122 | 0.00 | U | 85.5 | 70 | 23-89 | 5 | 0-30 |
| 98-95-3 | MSD | Nitrobenzene | 122 | 0.00 | U | 111 | 91 | 38-123 | 7 | 0-30 |
| 78-59-1 | MSD | Isophorone | 122 | 0.00 | U | 110 | 90 | 40-127 | 4 | 0-30 |
| 88-75-5 | MSD | 2-Nitrophenol | 122 | 0.00 | U | 108 | 89 | 35-116 | 9 | 0-30 |
| 105-67-9 | MSD | 2,4-Dimethylphenol | 122 | 0.00 | U | 97.0 | 80 | 34-109 | 5 | 0-30 |
| 111-91-1 | MSD | bis(2-Chloroethoxy)methane | 122 | 0.00 | U | 114 | 93 | 41-116 | 5 | 0-30 |
| 120-83-2 | MSD | 2,4-Dichlorophenol | 122 | 0.00 | U | 101 | 83 | 35-113 | 6 | 0-30 |
| 65-85-0 | MSD | Benzoic acid | 244 | 0.00 | U | 89.4 | 37 | 12-94 | 24 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87204MSD**
**Lab Sample ID** **1203203428**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/06/2014 22:34**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 106-47-8 | MSD | 4-Chloroaniline | 122 | 0.00 | U | 115 | 95 | 32-122 | 6 | 0-30 |
| 87-68-3 | MSD | Hexachlorobutadiene | 122 | 0.00 | U | 80.4 | 66 | 23-90 | 3 | 0-30 |
| 59-50-7 | MSD | Parachlorometa cresol<br>*4-Chloro-3-methylphenol* | 122 | 0.00 | U | 106 | 87 | 37-119 | 7 | 0-30 |
| 77-47-4 | MSD | Hexachlorocyclopentadiene | 122 | 0.00 | U | 64.2 | 53 | 10-84 | 15 | 0-30 |
| 88-06-2 | MSD | 2,4,6-Trichlorophenol | 122 | 0.00 | U | 108 | 88 | 36-120 | 4 | 0-30 |
| 95-95-4 | MSD | 2,4,5-Trichlorophenol | 122 | 0.00 | U | 108 | 89 | 37-121 | 5 | 0-30 |
| 91-58-7 | MSD | 2-Chloronaphthalene | 122 | 0.00 | U | 102 | 83 | 32-103 | 5 | 0-30 |
| 88-74-4 | MSD | 2-Nitroaniline<br>*o-Nitroaniline* | 122 | 0.00 | U | 123 | 101 | 38-126 | 11 | 0-30 |
| 99-09-2 | MSD | 3-Nitroaniline<br>*m-Nitroaniline* | 122 | 0.00 | U | 130 | 106 | 30-131 | 15 | 0-30 |
| 131-11-3 | MSD | Dimethylphthalate | 122 | 0.00 | U | 119 | 97 | 45-121 | 3 | 0-30 |
| 606-20-2 | MSD | 2,6-Dinitrotoluene | 122 | 0.00 | U | 115 | 94 | 44-120 | 8 | 0-30 |
| 121-14-2 | MSD | 2,4-Dinitrotoluene | 122 | 0.00 | U | 118 | 97 | 44-127 | 7 | 0-30 |
| 51-28-5 | MSD | 2,4-Dinitrophenol | 122 | 0.00 | U | 78.6 | 64 | 10-133 | 33 * | 0-30 |
| 132-64-9 | MSD | Dibenzofuran | 122 | 0.00 | U | 117 | 96 | 39-114 | 6 | 0-30 |
| 58-90-2 | MSD | 2,3,4,6-Tetrachlorophenol | 122 | 0.00 | U | 108 | 89 | 34-125 | 11 | 0-30 |
| 84-66-2 | MSD | Diethylphthalate | 122 | 0.00 | U | 119 | 97 | 44-124 | 4 | 0-30 |
| 100-02-7 | MSD | 4-Nitrophenol | 122 | 0.00 | U | 77.9 | 64 | 10-83 | 24 | 0-30 |
| 7005-72-3 | MSD | 4-Chlorophenylphenylether | 122 | 0.00 | U | 112 | 92 | 37-112 | 5 | 0-30 |
| 100-01-6 | MSD | 4-Nitroaniline<br>*p-Nitroaniline* | 122 | 0.00 | U | 157 | 129 | 27-149 | 21 | 0-30 |
| 534-52-1 | MSD | 2-Methyl-4,6-dinitrophenol | 122 | 0.00 | U | 96.0 | 79 | 28-131 | 12 | 0-30 |
| 122-39-4 | MSD | Diphenylamine | 122 | 0.00 | U | 110 | 91 | 34-117 | 0 | 0-30 |
| 122-66-7 | MSD | Azobenzene<br>*1,2-Diphenylhydrazine* | 122 | 0.00 | U | 109 | 89 | 36-115 | 2 | 0-30 |

**Semi-Volatile**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87204MSD**
**Lab Sample ID** **1203203428**
**Instrument:** **MSD5.I**
**Analyst:** **RMB**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/06/2014 22:34**
**Prep Batch ID:** **1433726**
**Batch ID:** **1433727**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 101-55-3 | MSD | 4-Bromophenylphenylether | 122 | 0.00 | U | 106 | 87 | 39-112 | 1 | 0-30 |
| 118-74-1 | MSD | Hexachlorobenzene | 122 | 0.00 | U | 104 | 85 | 39-114 | 1 | 0-30 |
| 84-74-2 | MSD | Di-n-butylphthalate | 122 | 0.00 | U | 119 | 98 | 40-122 | 1 | 0-30 |
| 85-68-7 | MSD | Butylbenzylphthalate | 122 | 0.00 | U | 109 | 89 | 36-124 | 6 | 0-30 |
| 117-81-7 | MSD | bis(2-Ethylhexyl)phthalate | 122 | 0.00 | U | 122 | 100 | 35-123 | 3 | 0-30 |
| 117-84-0 | MSD | Di-n-octylphthalate | 122 | 0.00 | U | 142 | 116 | 32-124 | 5 | 0-30 |
| 123-91-1 | MSD | 1,4-Dioxane | 122 | 0.00 | U | 104 | 86 | 27-94 | 9 | 0-30 |
| 930-55-2 | MSD | N-Nitrosopyrrolidine | 122 | 0.00 | U | 119 | 97 | 43-117 | 6 | 0-30 |
| 95-94-3 | MSD | 1,2,4,5-Tetrachlorobenzene | 122 | 0.00 | U | 94.5 | 78 | 28-96 | 4 | 0-30 |
| 1912-24-9 | MSD | Atrazine | 122 | 0.00 | U | 132 | 108 | 18-119 | 1 | 0-30 |
| 92-87-5 | MSD | Benzidine | 244 | 0.00 | U | 310 | 127 | 10-127 | 22 | 0-30 |
| 91-94-1 | MSD | 3,3'-Dichlorobenzidine | 122 | 0.00 | U | 132 | 109 | 19-120 | 9 | 0-30 |
| 120-82-1 | MSD | 1,2,4-Trichlorobenzene | 122 | 0.00 | U | 88.6 | 73 | 26-92 | 6 | 0-30 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1433726** | **Instrument ID:** | **MSD5.I** | **Data File:** | **s110614.b\s5K0607.D** |
| **Lab Sample ID:** | **1203203425** | **Prep Date:** | **11/06/2014 10:25** | **Analyzed:** | **11/06/14 18:24** |
| **Column:** | **DB-5ms** | | | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1433726 | 1203203426 | s110614.b\s5K0608.D | 11/06/14 | 1855 |
| 02 CAWR-14-89229 | 360425003 | s110614.b\s5K0611.D | 11/06/14 | 2029 |
| 03 CAWR-14-89222 | 360425009 | s110614.b\s5K0612.D | 11/06/14 | 2101 |
| 04 CAPA-14-87204MS | 1203203427 | s110614.b\s5K0614.D | 11/06/14 | 2203 |
| 05 CAPA-14-87204MSD | 1203203428 | s110614.b\s5K0615.D | 11/06/14 | 2234 |

# Quality Control Data

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203425** | | | | |
| **Client Sample:** | **QC for batch 1433726** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1433726** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 18:24** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0607.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | U | 20.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | U | 1.00 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | U | 10.0 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | U | 10.0 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | U | 10.0 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | U | 20.0 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | U | 10.0 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203425** | | | | |
| **Client Sample:** | **QC for batch 1433726** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1433726** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 18:24** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0607.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 118-74-1 | Hexachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | U | 10.0 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | U | 10.0 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | U | 10.0 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | U | 10.0 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | U | 10.0 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | U | 10.0 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | U | 10.0 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 75.1 | 100 | ug/L | 75.1 | (33%-126%) |
| 2-Fluorobiphenyl | 43.6 | 50.0 | ug/L | 87.2 | (35%-102%) |
| 2-Fluorophenol | 48.9 | 100 | ug/L | 48.9 | (18%-84%) |
| Nitrobenzene-d5 | 43.6 | 50.0 | ug/L | 87.1 | (38%-113%) |
| Phenol-d5 | 31.3 | 100 | ug/L | 31.3 | (10%-110%) |
| p-Terphenyl-d14 | 48.3 | 50.0 | ug/L | 96.5 | (38%-123%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated | Units | Fit | Qual |
|---|---|---|---|---|---|---|
| | unknown | 22.63 | 5.32 | ug/L | 0 | J |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203426** | | | | |
| **Client Sample:** | **QC for batch 1433726** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1433726** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 18:55** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0608.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 36.9 | ug/L | 3.00 | 10.0 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 35.5 | ug/L | 3.00 | 10.0 |
| 95-50-1 | 1,2-Dichlorobenzene | | 35.5 | ug/L | 3.00 | 10.0 |
| 122-66-7 | Azobenzene | | 46.7 | ug/L | 3.00 | 10.0 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 33.6 | ug/L | 3.00 | 10.0 |
| 106-46-7 | 1,4-Dichlorobenzene | | 36.1 | ug/L | 3.00 | 10.0 |
| 123-91-1 | 1,4-Dioxane | | 32.3 | ug/L | 3.00 | 10.0 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 45.1 | ug/L | 3.00 | 10.0 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 44.3 | ug/L | 3.00 | 10.0 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 44.1 | ug/L | 3.00 | 10.0 |
| 120-83-2 | 2,4-Dichlorophenol | | 41.7 | ug/L | 3.00 | 10.0 |
| 105-67-9 | 2,4-Dimethylphenol | | 40.9 | ug/L | 3.00 | 10.0 |
| 51-28-5 | 2,4-Dinitrophenol | | 29.0 | ug/L | 5.00 | 20.0 |
| 121-14-2 | 2,4-Dinitrotoluene | | 50.4 | ug/L | 3.00 | 10.0 |
| 606-20-2 | 2,6-Dinitrotoluene | | 47.4 | ug/L | 3.00 | 10.0 |
| 91-58-7 | 2-Chloronaphthalene | | 40.4 | ug/L | 0.410 | 1.00 |
| 95-57-8 | 2-Chlorophenol | | 41.4 | ug/L | 3.00 | 10.0 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 40.0 | ug/L | 3.00 | 10.0 |
| 88-75-5 | 2-Nitrophenol | | 44.4 | ug/L | 3.00 | 10.0 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 55.3 | ug/L | 3.00 | 10.0 |
| 101-55-3 | 4-Bromophenylphenylether | | 44.9 | ug/L | 3.00 | 10.0 |
| 59-50-7 | Parachlorometa cresol | | 45.3 | ug/L | 3.00 | 10.0 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 48.9 | ug/L | 3.30 | 10.0 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 46.3 | ug/L | 3.00 | 10.0 |
| 100-02-7 | 4-Nitrophenol | | 17.8 | ug/L | 3.00 | 10.0 |
| 62-53-3 | Aniline | | 49.3 | ug/L | 4.20 | 10.0 |
| 1912-24-9 | Atrazine | | 56.1 | ug/L | 3.00 | 10.0 |
| 92-87-5 | Benzidine | | 117 | ug/L | 3.90 | 10.0 |
| 65-85-0 | Benzoic acid | J | 16.3 | ug/L | 6.00 | 20.0 |
| 100-51-6 | Benzyl alcohol | | 42.0 | ug/L | 3.00 | 10.0 |
| 85-68-7 | Butylbenzylphthalate | | 50.3 | ug/L | 3.00 | 10.0 |
| 84-74-2 | Di-n-butylphthalate | | 50.2 | ug/L | 3.00 | 10.0 |
| 117-84-0 | Di-n-octylphthalate | | 61.0 | ug/L | 3.00 | 10.0 |
| 132-64-9 | Dibenzofuran | | 47.9 | ug/L | 3.00 | 10.0 |
| 84-66-2 | Diethylphthalate | | 49.1 | ug/L | 3.00 | 10.0 |
| 131-11-3 | Dimethylphthalate | | 49.5 | ug/L | 3.00 | 10.0 |
| 88-85-7 | Dinoseb | U | 10.0 | ug/L | 3.00 | 10.0 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203426** | | | | |
| **Client Sample:** | **QC for batch 1433726** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1433726** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 18:55** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0608.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 47.0 | ug/L | 3.00 | 10.0 |
| 118-74-1 | Hexachlorobenzene | | 43.1 | ug/L | 3.00 | 10.0 |
| 87-68-3 | Hexachlorobutadiene | | 33.0 | ug/L | 3.00 | 10.0 |
| 77-47-4 | Hexachlorocyclopentadiene | | 24.8 | ug/L | 3.00 | 10.0 |
| 67-72-1 | Hexachloroethane | | 33.2 | ug/L | 3.00 | 10.0 |
| 78-59-1 | Isophorone | | 46.1 | ug/L | 3.50 | 10.0 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 34.1 | ug/L | 3.00 | 10.0 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 55-18-5 | N-Nitrosodiethylamine | U | 10.0 | ug/L | 3.00 | 10.0 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 46.1 | ug/L | 3.00 | 10.0 |
| 930-55-2 | N-Nitrosopyrrolidine | | 46.3 | ug/L | 3.00 | 10.0 |
| 98-95-3 | Nitrobenzene | | 45.4 | ug/L | 3.00 | 10.0 |
| 608-93-5 | Pentachlorobenzene | U | 10.0 | ug/L | 3.00 | 10.0 |
| 108-95-2 | Phenol | | 18.2 | ug/L | 3.00 | 10.0 |
| 110-86-1 | Pyridine | | 38.7 | ug/L | 3.00 | 10.0 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 43.1 | ug/L | 3.00 | 10.0 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 47.2 | ug/L | 3.00 | 10.0 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 45.9 | ug/L | 3.00 | 10.0 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 56.0 | ug/L | 3.00 | 10.0 |
| 65794-96-9 | m,p-Cresols | | 41.1 | ug/L | 3.70 | 10.0 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 53.3 | ug/L | 3.00 | 10.0 |
| 95-48-7 | o-Cresol | | 38.9 | ug/L | 3.00 | 10.0 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 50.5 | ug/L | 3.00 | 10.0 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 65.3 | ug/L | 3.00 | 10.0 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 93.3 | 100 | ug/L | 93.3 | (33%-126%) |
| 2-Fluorobiphenyl | 42.7 | 50.0 | ug/L | 85.4 | (35%-102%) |
| 2-Fluorophenol | 52.2 | 100 | ug/L | 52.2 | (18%-84%) |
| Nitrobenzene-d5 | 45.9 | 50.0 | ug/L | 91.7 | (38%-113%) |
| Phenol-d5 | 33.9 | 100 | ug/L | 33.9 | (10%-110%) |
| p-Terphenyl-d14 | 41.9 | 50.0 | ug/L | 83.8 | (38%-123%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203203427** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **QC for batch 1433726** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAPA-14-87204MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 22:03** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **410 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0614.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 91.0 | ug/L | 7.32 | 24.4 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 83.6 | ug/L | 7.32 | 24.4 |
| 95-50-1 | 1,2-Dichlorobenzene | | 84.7 | ug/L | 7.32 | 24.4 |
| 122-66-7 | Azobenzene | | 111 | ug/L | 7.32 | 24.4 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 82.0 | ug/L | 7.32 | 24.4 |
| 106-46-7 | 1,4-Dichlorobenzene | | 86.2 | ug/L | 7.32 | 24.4 |
| 123-91-1 | 1,4-Dioxane | | 95.3 | ug/L | 7.32 | 24.4 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 96.7 | ug/L | 7.32 | 24.4 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 103 | ug/L | 7.32 | 24.4 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 103 | ug/L | 7.32 | 24.4 |
| 120-83-2 | 2,4-Dichlorophenol | | 95.0 | ug/L | 7.32 | 24.4 |
| 105-67-9 | 2,4-Dimethylphenol | | 92.4 | ug/L | 7.32 | 24.4 |
| 51-28-5 | 2,4-Dinitrophenol | | 56.5 | ug/L | 12.2 | 48.8 |
| 121-14-2 | 2,4-Dinitrotoluene | | 111 | ug/L | 7.32 | 24.4 |
| 606-20-2 | 2,6-Dinitrotoluene | | 106 | ug/L | 7.32 | 24.4 |
| 91-58-7 | 2-Chloronaphthalene | | 96.9 | ug/L | 1.00 | 2.44 |
| 95-57-8 | 2-Chlorophenol | | 98.3 | ug/L | 7.32 | 24.4 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 85.3 | ug/L | 7.32 | 24.4 |
| 88-75-5 | 2-Nitrophenol | | 98.4 | ug/L | 7.32 | 24.4 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 121 | ug/L | 7.32 | 24.4 |
| 101-55-3 | 4-Bromophenylphenylether | | 107 | ug/L | 7.32 | 24.4 |
| 59-50-7 | Parachlorometa cresol | | 98.8 | ug/L | 7.32 | 24.4 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 109 | ug/L | 8.05 | 24.4 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 107 | ug/L | 7.32 | 24.4 |
| 100-02-7 | 4-Nitrophenol | | 61.5 | ug/L | 7.32 | 24.4 |
| 62-53-3 | Aniline | | 119 | ug/L | 10.2 | 24.4 |
| 1912-24-9 | Atrazine | | 132 | ug/L | 7.32 | 24.4 |
| 92-87-5 | Benzidine | | 249 | ug/L | 9.51 | 24.4 |
| 65-85-0 | Benzoic acid | | 70.5 | ug/L | 14.6 | 48.8 |
| 100-51-6 | Benzyl alcohol | | 107 | ug/L | 7.32 | 24.4 |
| 85-68-7 | Butylbenzylphthalate | | 115 | ug/L | 7.32 | 24.4 |
| 84-74-2 | Di-n-butylphthalate | | 118 | ug/L | 7.32 | 24.4 |
| 117-84-0 | Di-n-octylphthalate | | 135 | ug/L | 7.32 | 24.4 |
| 132-64-9 | Dibenzofuran | | 111 | ug/L | 7.32 | 24.4 |
| 84-66-2 | Diethylphthalate | | 114 | ug/L | 7.32 | 24.4 |
| 131-11-3 | Dimethylphthalate | | 115 | ug/L | 7.32 | 24.4 |
| 88-85-7 | Dinoseb | U | 24.4 | ug/L | 7.32 | 24.4 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203203427** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **QC for batch 1433726** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAPA-14-87204MS** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 22:03** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **410 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0614.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 110 | ug/L | 7.32 | 24.4 |
| 118-74-1 | Hexachlorobenzene | | 105 | ug/L | 7.32 | 24.4 |
| 87-68-3 | Hexachlorobutadiene | | 77.9 | ug/L | 7.32 | 24.4 |
| 77-47-4 | Hexachlorocyclopentadiene | | 55.2 | ug/L | 7.32 | 24.4 |
| 67-72-1 | Hexachloroethane | | 80.9 | ug/L | 7.32 | 24.4 |
| 78-59-1 | Isophorone | | 106 | ug/L | 8.54 | 24.4 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 107 | ug/L | 7.32 | 24.4 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 24.4 | ug/L | 7.32 | 24.4 |
| 55-18-5 | N-Nitrosodiethylamine | U | 24.4 | ug/L | 7.32 | 24.4 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 109 | ug/L | 7.32 | 24.4 |
| 930-55-2 | N-Nitrosopyrrolidine | | 112 | ug/L | 7.32 | 24.4 |
| 98-95-3 | Nitrobenzene | | 104 | ug/L | 7.32 | 24.4 |
| 608-93-5 | Pentachlorobenzene | U | 24.4 | ug/L | 7.32 | 24.4 |
| 108-95-2 | Phenol | | 69.0 | ug/L | 7.32 | 24.4 |
| 110-86-1 | Pyridine | | 113 | ug/L | 7.32 | 24.4 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 102 | ug/L | 7.32 | 24.4 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 108 | ug/L | 7.32 | 24.4 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 110 | ug/L | 7.32 | 24.4 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 126 | ug/L | 7.32 | 24.4 |
| 65794-96-9 | m,p-Cresols | | 109 | ug/L | 9.02 | 24.4 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 112 | ug/L | 7.32 | 24.4 |
| 95-48-7 | o-Cresol | | 99.5 | ug/L | 7.32 | 24.4 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 111 | ug/L | 7.32 | 24.4 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 127 | ug/L | 7.32 | 24.4 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 202 | 244 | ug/L | 82.7 | (33%-126%) |
| 2-Fluorobiphenyl | 103 | 122 | ug/L | 84.8 | (35%-102%) |
| 2-Fluorophenol | 159 | 244 | ug/L | 65.1 | (18%-84%) |
| Nitrobenzene-d5 | 104 | 122 | ug/L | 85.6 | (38%-113%) |
| Phenol-d5 | 128 | 244 | ug/L | 52.4 | (10%-110%) |
| p-Terphenyl-d14 | 94.6 | 122 | ug/L | 77.6 | (38%-123%) |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203203428** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **QC for batch 1433726** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAPA-14-87204MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 22:34** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **410 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0615.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | | 94.5 | ug/L | 7.32 | 24.4 |
| 120-82-1 | 1,2,4-Trichlorobenzene | | 88.6 | ug/L | 7.32 | 24.4 |
| 95-50-1 | 1,2-Dichlorobenzene | | 91.9 | ug/L | 7.32 | 24.4 |
| 122-66-7 | Azobenzene | | 109 | ug/L | 7.32 | 24.4 |
| | *1,2-Diphenylhydrazine* | | | | | |
| 541-73-1 | 1,3-Dichlorobenzene | | 87.1 | ug/L | 7.32 | 24.4 |
| 106-46-7 | 1,4-Dichlorobenzene | | 94.3 | ug/L | 7.32 | 24.4 |
| 123-91-1 | 1,4-Dioxane | | 104 | ug/L | 7.32 | 24.4 |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | | 108 | ug/L | 7.32 | 24.4 |
| 95-95-4 | 2,4,5-Trichlorophenol | | 108 | ug/L | 7.32 | 24.4 |
| 88-06-2 | 2,4,6-Trichlorophenol | | 108 | ug/L | 7.32 | 24.4 |
| 120-83-2 | 2,4-Dichlorophenol | | 101 | ug/L | 7.32 | 24.4 |
| 105-67-9 | 2,4-Dimethylphenol | | 97.0 | ug/L | 7.32 | 24.4 |
| 51-28-5 | 2,4-Dinitrophenol | | 78.6 | ug/L | 12.2 | 48.8 |
| 121-14-2 | 2,4-Dinitrotoluene | | 118 | ug/L | 7.32 | 24.4 |
| 606-20-2 | 2,6-Dinitrotoluene | | 115 | ug/L | 7.32 | 24.4 |
| 91-58-7 | 2-Chloronaphthalene | | 102 | ug/L | 1.00 | 2.44 |
| 95-57-8 | 2-Chlorophenol | | 107 | ug/L | 7.32 | 24.4 |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | | 96.0 | ug/L | 7.32 | 24.4 |
| 88-75-5 | 2-Nitrophenol | | 108 | ug/L | 7.32 | 24.4 |
| 91-94-1 | 3,3'-Dichlorobenzidine | | 132 | ug/L | 7.32 | 24.4 |
| 101-55-3 | 4-Bromophenylphenylether | | 106 | ug/L | 7.32 | 24.4 |
| 59-50-7 | Parachlorometa cresol | | 106 | ug/L | 7.32 | 24.4 |
| | *4-Chloro-3-methylphenol* | | | | | |
| 106-47-8 | 4-Chloroaniline | | 115 | ug/L | 8.05 | 24.4 |
| 7005-72-3 | 4-Chlorophenylphenylether | | 112 | ug/L | 7.32 | 24.4 |
| 100-02-7 | 4-Nitrophenol | | 77.9 | ug/L | 7.32 | 24.4 |
| 62-53-3 | Aniline | | 128 | ug/L | 10.2 | 24.4 |
| 1912-24-9 | Atrazine | | 132 | ug/L | 7.32 | 24.4 |
| 92-87-5 | Benzidine | E | 310 | ug/L | 9.51 | 24.4 |
| 65-85-0 | Benzoic acid | | 89.4 | ug/L | 14.6 | 48.8 |
| 100-51-6 | Benzyl alcohol | | 116 | ug/L | 7.32 | 24.4 |
| 85-68-7 | Butylbenzylphthalate | | 109 | ug/L | 7.32 | 24.4 |
| 84-74-2 | Di-n-butylphthalate | | 119 | ug/L | 7.32 | 24.4 |
| 117-84-0 | Di-n-octylphthalate | | 142 | ug/L | 7.32 | 24.4 |
| 132-64-9 | Dibenzofuran | | 117 | ug/L | 7.32 | 24.4 |
| 84-66-2 | Diethylphthalate | | 119 | ug/L | 7.32 | 24.4 |
| 131-11-3 | Dimethylphthalate | | 119 | ug/L | 7.32 | 24.4 |
| 88-85-7 | Dinoseb | U | 24.4 | ug/L | 7.32 | 24.4 |

# Semi-Volatile
# Certificate of Analysis
# Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203203428** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **QC for batch 1433726** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAPA-14-87204MSD** | **Method:** | **SW846 3510C/8270D** | **SOP Ref:** | **GL-OA-E-009** |
| **Batch ID:** | **1433727** | **Inst:** | **MSD5.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 22:34** | **Analyst:** | **RMB** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 10:25** | **Aliquot:** | **410 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **s110614.b\s5K0615.D** | **Column:** | **DB-5ms** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 122-39-4 | Diphenylamine | | 110 | ug/L | 7.32 | 24.4 |
| 118-74-1 | Hexachlorobenzene | | 104 | ug/L | 7.32 | 24.4 |
| 87-68-3 | Hexachlorobutadiene | | 80.4 | ug/L | 7.32 | 24.4 |
| 77-47-4 | Hexachlorocyclopentadiene | | 64.2 | ug/L | 7.32 | 24.4 |
| 67-72-1 | Hexachloroethane | | 85.5 | ug/L | 7.32 | 24.4 |
| 78-59-1 | Isophorone | | 110 | ug/L | 8.54 | 24.4 |
| 62-75-9 | N-Methyl-N-nitrosomethylamine | | 115 | ug/L | 7.32 | 24.4 |
| 924-16-3 | N-Nitrosodi-n-butylamine | U | 24.4 | ug/L | 7.32 | 24.4 |
| 55-18-5 | N-Nitrosodiethylamine | U | 24.4 | ug/L | 7.32 | 24.4 |
| 621-64-7 | N-Nitrosodi--n-propylamine<br>*N-Nitrosodipropylamine* | | 115 | ug/L | 7.32 | 24.4 |
| 930-55-2 | N-Nitrosopyrrolidine | | 119 | ug/L | 7.32 | 24.4 |
| 98-95-3 | Nitrobenzene | | 111 | ug/L | 7.32 | 24.4 |
| 608-93-5 | Pentachlorobenzene | U | 24.4 | ug/L | 7.32 | 24.4 |
| 108-95-2 | Phenol | | 75.7 | ug/L | 7.32 | 24.4 |
| 110-86-1 | Pyridine | | 120 | ug/L | 7.32 | 24.4 |
| 108-60-1 | bis(2-Chloro-1-methylethyl)ether | | 110 | ug/L | 7.32 | 24.4 |
| 111-91-1 | bis(2-Chloroethoxy)methane | | 114 | ug/L | 7.32 | 24.4 |
| 111-44-4 | bis(2-Chloroethyl) ether | | 118 | ug/L | 7.32 | 24.4 |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | | 122 | ug/L | 7.32 | 24.4 |
| 65794-96-9 | m,p-Cresols | | 119 | ug/L | 9.02 | 24.4 |
| 99-09-2 | 3-Nitroaniline<br>*m-Nitroaniline* | | 130 | ug/L | 7.32 | 24.4 |
| 95-48-7 | o-Cresol | | 108 | ug/L | 7.32 | 24.4 |
| 88-74-4 | 2-Nitroaniline<br>*o-Nitroaniline* | | 123 | ug/L | 7.32 | 24.4 |
| 100-01-6 | 4-Nitroaniline<br>*p-Nitroaniline* | | 157 | ug/L | 7.32 | 24.4 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4,6-Tribromophenol | 227 | 244 | ug/L | 92.9 | (33%-126%) |
| 2-Fluorobiphenyl | 107 | 122 | ug/L | 87.5 | (35%-102%) |
| 2-Fluorophenol | 174 | 244 | ug/L | 71.2 | (18%-84%) |
| Nitrobenzene-d5 | 111 | 122 | ug/L | 91.2 | (38%-113%) |
| Phenol-d5 | 141 | 244 | ug/L | 58.0 | (10%-110%) |
| p-Terphenyl-d14 | 91.4 | 122 | ug/L | 74.9 | (38%-123%) |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 10-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| SEMIVOA GC/MS | SW846 3510C/8270D | Liquid | ARSL(ESHL), SNLS |
| **Batch ID:** | **Sample Numbers:** | | |
| 1433727 | See Below | | |

**Potentially affected work order(s)(SDG): 360424(2015-204),360425(2015-207),360431(2015-208)**

**Application Issues:**

Failed RPD for MS/MSD, or PS/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. The MS(1203203427)/MSD(1203203428) pair displayed RPD values for 2,4-Dinitrophenol outside the acceptance criteria. Please see the QC Summary/Spike Recovery Report for the specific RPD values. | 1. Since 2,4-Dinitrophenol was individually within the acceptance criteria for the MS and MSD, the non-conformance had no adverse impact on the data. The LCS passed recovery for this analyte. The results are reported. |

**Originator's Name:**

Richard Bomar 10-NOV-14

**Data Validator/Group Leader:**

Herbert Maier 10-NOV-14

# HPLC Polynuclear Aromatic Hydrocarbon Analysis

**HPLC-PAH**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Polynuclear Aromatic Hydrocarbons** |
| Analytical Method: | SW846 8310 |
| Prep Method: | SW846 3510C |
| Analytical Batch Number: | 1433806 |
| Prep Batch Number: | 1433805 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

| Sample ID | Client ID |
|---|---|
| 360425004 | CAWR-14-89229 |
| 360425010 | CAWR-14-89222 |
| 1203203603 | MB for batch 1433805 |
| 1203203604 | Laboratory Control Sample (LCS) |
| 1203203607 | Laboratory Control Sample Duplicate (LCSD) |
| 1203203605 | 360431004(CAPA-14-87204) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

## Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**CCV Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB (1203203603) analyzed with this analytical batch did not meet the established acceptance criteria. Benzo(k)fluoranthene was detected above the MDL/limit of detection but below the PQL/limit of quantitation at 0.010 ug/L. Since Benzo(k)fluoranthene was not detected in the associated samples, the data are reported with the appropriate DER. The MB contamination is attributed to vagaries in the extraction process. Benzo(k)fluoranthene is 'B' qualified in the LCS (1203203604), LCSD (1203203607), and MS (1203203605).

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPDs between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Client sample 360431004 (CAPA-14-87204) from SDG 2015-208 was chosen for matrix spike analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Technical Information:**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required for this SDG.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data Exception Report 1355752 was generated for this SDG.
**Manual Integrations**
Some initial calibration standards required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

**Additional Comments**
The Form 8 is used only as a sequence of the analysis.

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the analyst, reviewer, and report specialist names associated with the generation of the data and package. The data validator will always sign and date the case narrative.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**System Configuration**

The laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

**Chromatographic Columns**

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207 GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

B The target analyte was detected in the associated blank.

J Value is estimated

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr. **Name: Michael Penny**

**Date: 29 NOV 2014** **Title: Group Leader**

# Roadmap for ARSL 2015-207 HPLC_PAH

This roadmap was analyzed by cww on 11-17-2014, 16:18.
This roadmap was reviewed by map on 11-18-2014, 07:59.
This roadmap was packaged by map on 11-19-2014, 14:24.

Sample

| exclude | manual | datafile | smpid | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p111014.b/ph5k1008.d | 360425004 | 10-NOV-2014 | 18:53 | 2015-207.sub | CAWR-14-89229 | 1 | 1433806 | |
| ☐ | N | /chem/hplce.i/p111014.b/ph5k1009.d | 360425010 | 10-NOV-2014 | 19:35 | 2015-207.sub | CAWR-14-89222 | 1 | 1433806 | |

QC Sample

| exclude | manual | datafile | smpid | sampletype | injdate | injtime | sublist | clientid | dilution | batchid | comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | N | /chem/hplce.i/p111014.b/ph5k1004A.d | 1203203603 | mb | 10-NOV-2014 | 16:04 | 2015-207.sub | PAHBLK01 | 1 | 1433806 | Blank contamination, no detections in samples. |
| ☐ | N | /chem/hplce.i/p111014.b/ph5k1005A.d | 1203203604 | lcs | 10-NOV-2014 | 16:46 | 2015-207.sub | PAHBLK01LCS | 1 | 1433806 | Pass |
| ☐ | N | /chem/hplce.i/p111014.b/ph5k1006A.d | 1203203607 | lcsd | 10-NOV-2014 | 17:29 | 2015-207.sub | PAHBLK01LCSD | 1 | 1433806 | Pass |

# Sample Data Summary

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425004** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1433806** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 18:53** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **11/06/2014 06:06** | **Aliquot:** | **930 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5k1008.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.538 | ug/L | 0.234 | 0.538 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 83-32-9 | Acenaphthene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 208-96-8 | Acenaphthylene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 120-12-7 | Anthracene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.0269 | ug/L | 0.0086 | 0.0269 |
| 218-01-9 | Chrysene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 206-44-0 | Fluoranthene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 86-73-7 | Fluorene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |
| 91-20-3 | Naphthalene | U | 0.538 | ug/L | 0.161 | 0.538 |
| 85-01-8 | Phenanthrene | U | 0.538 | ug/L | 0.196 | 0.538 |
| 129-00-0 | Pyrene | U | 0.0538 | ug/L | 0.0172 | 0.0538 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 169 | 269 | ug/L | 62.9 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425010** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **PAH** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1433806** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 19:35** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **11/06/2014 06:06** | **Aliquot:** | **960 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5k1009.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.521 | ug/L | 0.227 | 0.521 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 83-32-9 | Acenaphthene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 208-96-8 | Acenaphthylene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 120-12-7 | Anthracene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 56-55-3 | Benzo(a)anthracene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 50-32-8 | Benzo(a)pyrene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 207-08-9 | Benzo(k)fluoranthene | U | 0.026 | ug/L | 0.00833 | 0.026 |
| 218-01-9 | Chrysene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 206-44-0 | Fluoranthene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 86-73-7 | Fluorene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |
| 91-20-3 | Naphthalene | U | 0.521 | ug/L | 0.156 | 0.521 |
| 85-01-8 | Phenanthrene | U | 0.521 | ug/L | 0.190 | 0.521 |
| 129-00-0 | Pyrene | U | 0.0521 | ug/L | 0.0167 | 0.0521 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 77.9 | 260 | ug/L | 29.9 | (21%-92%) |

# QC Summary

**PAH by HPLC**

**Surrogate Recovery Report**

**SDG Number: 2015-207**

**Matrix Type: LIQUID**

**PACK Column (1) : C-18, DAD/FLD**

| Sample ID | Client ID | DFBF %REC |
|---|---|---|
| 1203203603 | MB for batch 1433805 | 58 |
| 1203203604 | LCS for batch 1433805 | 59 |
| 1203203607 | LCSD for batch 1433805 | 50 |
| 360425004 | CAWR-14-89229 | 63 |
| 360425010 | CAWR-14-89222 | 30 |
| 1203203605 | CAPA-14-87204MS | 63 |

| Surrogate | Acceptance Limits |
|---|---|
| DFBF = Decafluorobiphenyl | (21%-92%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1433805**
**Lab Sample ID** **1203203604**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 16:46**
**Prep Batch ID:** **1433805**
**Batch ID:** **1433806**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 91-20-3 | LCS | Naphthalene | 50.0 | 0.0 | 35.5 | 71 | 46-92 |
| 91-57-6 | LCS | 2-Methylnaphthalene | 50.0 | 0.0 | 41.2 | 82 | 45-106 |
| 90-12-0 | LCS | 1-Methylnaphthalene | 50.0 | 0.0 | 38.2 | 76 | 47-93 |
| 208-96-8 | LCS | Acenaphthylene | 50.0 | 0.0 | 38.4 | 77 | 55-101 |
| 83-32-9 | LCS | Acenaphthene | 50.0 | 0.0 | 40.7 | 81 | 56-102 |
| 86-73-7 | LCS | Fluorene | 50.0 | 0.0 | 40.2 | 80 | 59-106 |
| 85-01-8 | LCS | Phenanthrene | 50.0 | 0.0 | 41.6 | 83 | 61-106 |
| 120-12-7 | LCS | Anthracene | 50.0 | 0.0 | 45.4 | 91 | 70-123 |
| 206-44-0 | LCS | Fluoranthene | 5.00 | 0.0 | 3.91 | 78 | 62-120 |
| 129-00-0 | LCS | Pyrene | 5.00 | 0.0 | 4.21 | 84 | 65-120 |
| 56-55-3 | LCS | Benzo(a)anthracene | 5.00 | 0.0 | 4.30 | 86 | 67-120 |
| 218-01-9 | LCS | Chrysene | 5.00 | 0.0 | 4.41 | 88 | 72-124 |
| 205-99-2 | LCS | Benzo(b)fluoranthene | 5.00 | 0.0 | 4.17 | 83 | 60-119 |
| 207-08-9 | LCS | Benzo(k)fluoranthene | 2.50 | 0.0 | 2.25 | 90 | 56-108 |
| 50-32-8 | LCS | Benzo(a)pyrene | 5.00 | 0.0 | 4.50 | 90 | 61-120 |
| 193-39-5 | LCS | Indeno(1,2,3-cd)pyrene | 5.00 | 0.0 | 4.32 | 86 | 60-120 |
| 53-70-3 | LCS | Dibenzo(a,h)anthracene | 5.00 | 0.0 | 3.47 | 69 | 33-113 |
| 191-24-2 | LCS | Benzo(ghi)perylene | 5.00 | 0.0 | 3.73 | 75 | 35-94 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCSD for batch 1433805**
**Lab Sample ID** **1203203607**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 17:29**
**Prep Batch ID:** **1433805**
**Batch ID:** **1433806**
**Dilution: 1**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 91-20-3 | LCSD Naphthalene | 50.0 | 0.0 | 30.8 | 62 | 46-92 | 14 | 0-26 |
| 91-57-6 | LCSD 2-Methylnaphthalene | 50.0 | 0.0 | 35.7 | 71 | 45-106 | 14 | 0-20 |
| 90-12-0 | LCSD 1-Methylnaphthalene | 50.0 | 0.0 | 32.7 | 65 | 47-93 | 15 | 0-20 |
| 208-96-8 | LCSD Acenaphthylene | 50.0 | 0.0 | 33.0 | 66 | 55-101 | 15 | 0-20 |
| 83-32-9 | LCSD Acenaphthene | 50.0 | 0.0 | 35.0 | 70 | 56-102 | 15 | 0-20 |
| 86-73-7 | LCSD Fluorene | 50.0 | 0.0 | 35.7 | 71 | 59-106 | 12 | 0-20 |
| 85-01-8 | LCSD Phenanthrene | 50.0 | 0.0 | 37.7 | 75 | 61-106 | 10 | 0-20 |
| 120-12-7 | LCSD Anthracene | 50.0 | 0.0 | 42.9 | 86 | 70-123 | 6 | 0-20 |
| 206-44-0 | LCSD Fluoranthene | 5.00 | 0.0 | 3.59 | 72 | 62-120 | 9 | 0-20 |
| 129-00-0 | LCSD Pyrene | 5.00 | 0.0 | 3.86 | 77 | 65-120 | 9 | 0-20 |
| 56-55-3 | LCSD Benzo(a)anthracene | 5.00 | 0.0 | 3.97 | 79 | 67-120 | 8 | 0-20 |
| 218-01-9 | LCSD Chrysene | 5.00 | 0.0 | 4.10 | 82 | 72-124 | 7 | 0-20 |
| 205-99-2 | LCSD Benzo(b)fluoranthene | 5.00 | 0.0 | 3.86 | 77 | 60-119 | 8 | 0-20 |
| 207-08-9 | LCSD Benzo(k)fluoranthene | 2.50 | 0.0 | 2.08 | 83 | 56-108 | 8 | 0-20 |
| 50-32-8 | LCSD Benzo(a)pyrene | 5.00 | 0.0 | 4.20 | 84 | 61-120 | 7 | 0-20 |
| 193-39-5 | LCSD Indeno(1,2,3-cd)pyrene | 5.00 | 0.0 | 4.06 | 81 | 60-120 | 6 | 0-20 |
| 53-70-3 | LCSD Dibenzo(a,h)anthracene | 5.00 | 0.0 | 3.07 | 61 | 33-113 | 12 | 0-20 |
| 191-24-2 | LCSD Benzo(ghi)perylene | 5.00 | 0.0 | 3.32 | 66 | 35-94 | 12 | 0-20 |

**PAH by HPLC**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87204MS**
**Lab Sample ID** **1203203605**
**Instrument:** **HPLCE.I**
**Analyst:** **CWW**
**Inj. Vol:** **20 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/10/2014 20:59**
**Prep Batch ID:** **1433805**
**Batch ID:** **1433806**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 91-20-3 | MS | Naphthalene | 54.3 | 0.00 | U | 39.4 | 72 | 31-105 |
| 91-57-6 | MS | 2-Methylnaphthalene | 54.3 | 0.00 | U | 45.4 | 84 | 45-106 |
| 90-12-0 | MS | 1-Methylnaphthalene | 54.3 | 0.00 | U | 42.1 | 77 | 47-93 |
| 208-96-8 | MS | Acenaphthylene | 54.3 | 0.00 | U | 42.4 | 78 | 42-107 |
| 83-32-9 | MS | Acenaphthene | 54.3 | 0.00 | U | 44.8 | 82 | 43-107 |
| 86-73-7 | MS | Fluorene | 54.3 | 0.00 | U | 42.9 | 79 | 48-109 |
| 85-01-8 | MS | Phenanthrene | 54.3 | 0.00 | U | 43.6 | 80 | 52-111 |
| 120-12-7 | MS | Anthracene | 54.3 | 0.00 | U | 46.9 | 86 | 56-125 |
| 206-44-0 | MS | Fluoranthene | 5.43 | 0.00 | U | 4.26 | 78 | 48-115 |
| 129-00-0 | MS | Pyrene | 5.43 | 0.00 | U | 4.33 | 80 | 47-130 |
| 56-55-3 | MS | Benzo(a)anthracene | 5.43 | 0.00 | U | 4.37 | 80 | 51-116 |
| 218-01-9 | MS | Chrysene | 5.43 | 0.00 | U | 4.52 | 83 | 56-130 |
| 205-99-2 | MS | Benzo(b)fluoranthene | 5.43 | 0.00 | U | 4.07 | 75 | 45-120 |
| 207-08-9 | MS | Benzo(k)fluoranthene | 2.72 | 0.00 | U | 2.24 | 82 | 39-122 |
| 50-32-8 | MS | Benzo(a)pyrene | 5.43 | 0.00 | U | 4.53 | 83 | 48-119 |
| 193-39-5 | MS | Indeno(1,2,3-cd)pyrene | 5.43 | 0.00 | U | 3.77 | 69 | 45-120 |
| 53-70-3 | MS | Dibenzo(a,h)anthracene | 5.43 | 0.00 | U | 3.88 | 71 | 33-136 |
| 191-24-2 | MS | Benzo(ghi)perylene | 5.43 | 0.00 | U | 3.32 | 61 | 34-115 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1433805** | **Instrument ID:** | **HPLCE.I** | **Data File:** | **ph5k1004.d** |
| **Lab Sample ID:** | **1203203603** | **Prep Date:** | **11/06/2014 06:06** | **Analyzed:** | **11/10/14 16:04** |
| **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** | | |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1433805 | 1203203604 | ph5k1005.d | 11/10/14 | 1646 |
| 02 LCSD for batch 1433805 | 1203203607 | ph5k1006.d | 11/10/14 | 1729 |
| 03 CAWR-14-89229 | 360425004 | ph5k1008.d | 11/10/14 | 1853 |
| 04 CAWR-14-89222 | 360425010 | ph5k1009.d | 11/10/14 | 1935 |
| 05 CAPA-14-87204MS | 1203203605 | ph5k1011.d | 11/10/14 | 2059 |

# QC Data

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203603** | | | | |
| **Client Sample:** | **QC for batch 1433805** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1433805** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1433806** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 16:04** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **11/06/2014 06:06** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5k1004.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | U | 0.500 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | J | 0.00999 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | U | 0.500 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | U | 0.500 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | U | 0.050 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 146 | 250 | ug/L | 58.3 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203604** | | | | |
| **Client Sample:** | **QC for batch 1433805** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1433805** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1433806** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 16:46** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **11/06/2014 06:06** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5k1005.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 38.2 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | | 41.2 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | | 40.7 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | | 38.4 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | | 45.4 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | | 4.30 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | | 4.50 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.17 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | | 3.73 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | B | 2.25 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | | 4.41 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 3.47 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | | 3.91 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | | 40.2 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.32 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | | 35.5 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | | 41.6 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | | 4.21 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 148 | 250 | ug/L | 59.1 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203607** | | | | |
| **Client Sample:** | **QC for batch 1433805** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1433805** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1433806** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 17:29** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **11/06/2014 06:06** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5k1006.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 32.7 | ug/L | 0.218 | 0.500 |
| 91-57-6 | 2-Methylnaphthalene | | 35.7 | ug/L | 0.150 | 0.500 |
| 83-32-9 | Acenaphthene | | 35.0 | ug/L | 0.150 | 0.500 |
| 208-96-8 | Acenaphthylene | | 33.0 | ug/L | 0.150 | 0.500 |
| 120-12-7 | Anthracene | | 42.9 | ug/L | 0.150 | 0.500 |
| 56-55-3 | Benzo(a)anthracene | | 3.97 | ug/L | 0.016 | 0.050 |
| 50-32-8 | Benzo(a)pyrene | | 4.20 | ug/L | 0.016 | 0.050 |
| 205-99-2 | Benzo(b)fluoranthene | | 3.86 | ug/L | 0.016 | 0.050 |
| 191-24-2 | Benzo(ghi)perylene | | 3.32 | ug/L | 0.016 | 0.050 |
| 207-08-9 | Benzo(k)fluoranthene | B | 2.08 | ug/L | 0.008 | 0.025 |
| 218-01-9 | Chrysene | | 4.10 | ug/L | 0.016 | 0.050 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 3.07 | ug/L | 0.016 | 0.050 |
| 206-44-0 | Fluoranthene | | 3.59 | ug/L | 0.016 | 0.050 |
| 86-73-7 | Fluorene | | 35.7 | ug/L | 0.150 | 0.500 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 4.06 | ug/L | 0.016 | 0.050 |
| 91-20-3 | Naphthalene | | 30.8 | ug/L | 0.150 | 0.500 |
| 85-01-8 | Phenanthrene | | 37.7 | ug/L | 0.182 | 0.500 |
| 129-00-0 | Pyrene | | 3.86 | ug/L | 0.016 | 0.050 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 125 | 250 | ug/L | 50.0 | (21%-92%) |

# PAH by HPLC
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203203605** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **QC for batch 1433805** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAPA-14-87204MS** | **Method:** | **SW846 8310** | **SOP Ref:** | **GL-OA-E-030** |
| **Batch ID:** | **1433806** | **Inst:** | **HPLCE.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 20:59** | **Analyst:** | **CWW** | **Inj. Vol:** | **20 uL** |
| **Prep Date:** | **11/06/2014 06:06** | **Aliquot:** | **920 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **ph5k1011.d** | **Column:** | **C-18, DAD/FLD** | **Level:** | **LOW** |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 90-12-0 | 1-Methylnaphthalene | | 42.1 | ug/L | 0.237 | 0.543 |
| 91-57-6 | 2-Methylnaphthalene | | 45.4 | ug/L | 0.163 | 0.543 |
| 83-32-9 | Acenaphthene | | 44.8 | ug/L | 0.163 | 0.543 |
| 208-96-8 | Acenaphthylene | | 42.4 | ug/L | 0.163 | 0.543 |
| 120-12-7 | Anthracene | | 46.9 | ug/L | 0.163 | 0.543 |
| 56-55-3 | Benzo(a)anthracene | | 4.37 | ug/L | 0.0174 | 0.0543 |
| 50-32-8 | Benzo(a)pyrene | | 4.53 | ug/L | 0.0174 | 0.0543 |
| 205-99-2 | Benzo(b)fluoranthene | | 4.07 | ug/L | 0.0174 | 0.0543 |
| 191-24-2 | Benzo(ghi)perylene | | 3.32 | ug/L | 0.0174 | 0.0543 |
| 207-08-9 | Benzo(k)fluoranthene | B | 2.24 | ug/L | 0.0087 | 0.0272 |
| 218-01-9 | Chrysene | | 4.52 | ug/L | 0.0174 | 0.0543 |
| 53-70-3 | Dibenzo(a,h)anthracene | | 3.88 | ug/L | 0.0174 | 0.0543 |
| 206-44-0 | Fluoranthene | | 4.26 | ug/L | 0.0174 | 0.0543 |
| 86-73-7 | Fluorene | | 42.9 | ug/L | 0.163 | 0.543 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 3.77 | ug/L | 0.0174 | 0.0543 |
| 91-20-3 | Naphthalene | | 39.4 | ug/L | 0.163 | 0.543 |
| 85-01-8 | Phenanthrene | | 43.6 | ug/L | 0.198 | 0.543 |
| 129-00-0 | Pyrene | | 4.33 | ug/L | 0.0174 | 0.0543 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Decafluorobiphenyl | 172 | 272 | ug/L | 63.3 | (21%-92%) |

# Miscellaneous Data

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 17-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| HPLC | SW846 8310 | Liquid | CONT,ARSL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1433806 | See Below | | |

**Potentially affected work order(s)(SDG): 360424(2015-204),360425(2015-207),360431(2015-208),360488**

**Application Issues:**

Failed Recovery for LCS/LCSD

Failed Yield for Surrogates

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Biased low spike recoveries were observed in LCSD (1203203607) for Naphthalene at 62% and Acenaphthylene at 66%. The SC recovery limits are 70-130%.<br><br>2. A biased low surrogate recovery was observed in sample 360431025 (CAPA-14-87205). The recovery was 0.01% and the acceptance range is 21-92%.<br><br>3. The MB (1203203603) analyzed with this analytical batch did not meet the established acceptance criteria. Benzo(k)fluoranthene was detected above the MDL/limit of detection but below the PQL/limit of quantitation at 0.010 ug/L. | 1. The low recoveries may be the result of vagaries in the extraction process. The LCS (1203203604) met spike recovery limits for all target analytes.<br><br>2. The biased low recovery for Decafluorbiphenyl may be the result of vagaries with the extraction process. Since the sample was still within twice the hold and sample volume was available, it was sent back for re-extraction. The re-extraction batch is 1435894<br><br>3. Since Benzo(k)fluoranthene was not detected in the associated samples, the data are reported with the appropriate DER. The MB contamination is attributed to vagaries in the extraction process. Benzo(k)fluoranthene is 'B' qualified in the LCS (1203203604), LCSD (1203203607), and MS (1203203605). |

**Originator's Name:**

Charles Wilson 17-NOV-14

**Data Validator/Group Leader:**

Michael Penny 18-NOV-14

# Perchlorates by LCMSMS Analysis

# Case Narrative

**Perchlorate by LC-MS/MS**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)** |
| Analytical Method: | SW846 6850 Modified |
| Prep Method: | SW846 6850 Modified |
| Analytical Batch Number: | 1434068 |
| Prep Batch Number: | 1434067 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203204342 | Interference Check Sample (ICS) |
| 1203204334 | Method Blank (MB) |
| 1203204335 | Laboratory Control Sample (LCS) |
| 1203204336 | 360431007(CAPA-14-87230) Matrix Spike (MS) |
| 1203204337 | 360431007(CAPA-14-87230) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 11.

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

**ICV Requirements**
All associated initial calibration verification standards (ICV) met the acceptance criteria.

**CCB Requirements**
All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

**CCV Requirements**
All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

**Low Level Standard (CRI) Requirements**
All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Interference Check Sample (ICS)**
The ICS spike recoveries met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Client sample 360431007 (CAPA-14-87230) from 2015-208 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits.

**Retention Time Standard Area Acceptance**
The retention time standard areas were within the required acceptance criteria for all samples and QC.

**Retention Time**
During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
The following samples 1203204334 (MB), 1203204335 (LCS), 1203204342 (ICS), 360425013 (CAWR-14-89223) and 360425016 (CAWR-14-89236) were not sequenced correctly for the initial analysis. The re-analysis data are reported.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Manual integrations were not required for any data file associated with this SDG.

**Method Comments**
The samples in this SDG were not originally analyzed using EPA Method 314.0.

**Additional Comments**
The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

**Perchlorate Isotope Ratio**
The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

**System Configuration**

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207  GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 14 NOV 2014**  **Title: Group Leader**

# Sample Data Summary

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1434067

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-89223

**Date Received:** 04-NOV-14

**GEL Job No (SDG):** 2015-207

**GEL Sample ID:** 360425013

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 10-NOV-14 17:56 | per1110016a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 10-NOV-14 17:56 | per1110016a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 10-NOV-14 17:56 | per1110016a |
| | Perchlorate-O(18) | | | 0.494 | ug/L | | 1 | 10-NOV-14 17:56 | per1110016a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1434067

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAWR-14-89236

**Date Received:** 04-NOV-14

**GEL Job No (SDG):** 2015-207

**GEL Sample ID:** 360425016

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 10-NOV-14 18:05 | per1110017a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 10-NOV-14 18:05 | per1110017a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 10-NOV-14 18:05 | per1110017a |
| | Perchlorate-O(18) | | | 0.480 | ug/L | | 1 | 10-NOV-14 18:05 | per1110017a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Quality Control Summary

## Perchlorate Laboratory Control Sample

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2015-207

**Extract Batch Code:** 1434067

**Date Filtered:** 06-NOV-14

**Matrix:** WATER

**Sample ID:** 1203204335

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | .194 | ug/L | 96.9 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.2 | | | | - |
| Perchlorate-101 | 0.200 | .184 | ug/L | 92.1 | | 85 - 115 |
| Perchlorate-O(18) | | .474 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

## Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2015-207

**Extract Batch Code:** 1434067

**Date Extracted:** 06-NOV-14

**GEL MS/PS ID:** 1203204336

**Client ID:** CAPA-14-87230

**GEL MSD/PSD ID:** 1203204337

**QC Type:** MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | 0.200 | 0.00177 | ug/L | 0.194 | 96.1 | .194 | 96.2 | .0397 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 3.58 | | 3.17 | | 3.13 | | 1.18 | | - |
| Perchlorate-101 | 0.200 | 0.00154 | ug/L | 0.191 | 94.6 | .193 | 95.8 | 1.21 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.483 | ug/L | 0.481 | | .473 | | 1.54 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1434067

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
MB

**Date Received:** 06-NOV-14

**GEL Job No (SDG):** 2015-207

**GEL Sample ID:** 1203204334

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 10-NOV-14 17:20 | per1110012a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 10-NOV-14 17:20 | per1110012a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 10-NOV-14 17:20 | per1110012a |
| | Perchlorate-O(18) | | | 0.478 | ug/L | | 1 | 10-NOV-14 17:20 | per1110012a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** EPA 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1434067

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
LCS

**Date Received:** 06-NOV-14

**GEL Job No (SDG):** 2015-207

**GEL Sample ID:** 1203204335

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.194 | ug/L | J | 1 | 10-NOV-14 17:29 | per1110013a |
| | Perchlorate Isotope Ratio | | | 3.2 | | | 1 | 10-NOV-14 17:29 | per1110013a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.184 | ug/L | J | 1 | 10-NOV-14 17:29 | per1110013a |
| | Perchlorate-O(18) | | | 0.474 | ug/L | | 1 | 10-NOV-14 17:29 | per1110013a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1434067

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
ICS

**Date Received:**

**GEL Job No (SDG):** 2015-207

**GEL Sample ID:** 1203204342

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.197 | ug/L | J | 1 | 10-NOV-14 17:38 | per1110014a |
| | Perchlorate Isotope Ratio | | | 3.08 | | | 1 | 10-NOV-14 17:38 | per1110014a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.194 | ug/L | J | 1 | 10-NOV-14 17:38 | per1110014a |
| | Perchlorate-O(18) | | | 0.484 | ug/L | | 1 | 10-NOV-14 17:38 | per1110014a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1434067

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAPA-14-87230MS

**Date Received:** 04-NOV-14

**GEL Job No (SDG):** 2015-207

**GEL Sample ID:** 1203204336

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.194 | ug/L | J | 1 | 08-NOV-14 04:40 | per1107074a |
| | Perchlorate Isotope Ratio | | | 3.17 | | | 1 | 08-NOV-14 04:40 | per1107074a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.191 | ug/L | J | 1 | 08-NOV-14 04:40 | per1107074a |
| | Perchlorate-O(18) | | | 0.481 | ug/L | | 1 | 08-NOV-14 04:40 | per1107074a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Perchlorate Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Lab Code:** GEL

**Instrument:** LCMSMS

**Method:** SW846 6850 Modified

**Matrix:** WATER

**Extraction Batch ID:** 1434067

**Extraction Type:** Filter/DAI

**Sample Volume/Weight:** 10.0 mL

**Concentrated Extract Volume:** 10.0

**Client Sample No.**
CAPA-14-87230MSD

**Date Received:** 04-NOV-14

**GEL Job No (SDG):** 2015-207

**GEL Sample ID:** 1203204337

**Date Filtered:** 06-NOV-14

**Injection Volume (uL):** 20

**%Solids:**

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|---|---|---|---|---|---|---|---|---|---|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.194 | ug/L | J | 1 | 08-NOV-14 04:49 | per1107075a |
| | Perchlorate Isotope Ratio | | | 3.13 | | | 1 | 08-NOV-14 04:49 | per1107075a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.193 | ug/L | J | 1 | 08-NOV-14 04:49 | per1107075a |
| | Perchlorate-O(18) | | | 0.473 | ug/L | | 1 | 08-NOV-14 04:49 | per1107075a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area.
The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\%\text{Solids}}$$

# Explosives by LCMSMS Analysis

# Case Narrative

**LC-MS/MS Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Definitive Low Level Analysis of Nitroaromatic Explosives Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by SW-846 Method 8321 Modified (8321M)** |
| Analytical Method: | SW846 3535/8321A Modified |
| Prep Method: | SW846 Method 3535 |
| Analytical Batch Number: | 1433023 |
| Prep Batch Number: | 1433022 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535/8321A Modified:

| Sample ID | Client ID |
|---|---|
| 360425005 | CAWR-14-89229 |
| 360425011 | CAWR-14-89222 |
| 1203201687 | MB for batch 1433022 |
| 1203201688 | Laboratory Control Sample (LCS) |
| 1203201689 | 360288007(WSTMO-14-86605) Matrix Spike (MS) |
| 1203201690 | 360288007(WSTMO-14-86605) Matrix Spike Duplicate (MSD) |

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-056 REV# 17.

**Primary Analyte Analysis**

## Calibration Information

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
The following calibration verification standards have not met requirements of 80-120% for this SDG: EXP1128059, EXP1128072, and EXP1128085. The data are Q qualified and are reported as stated in the SOP. The analytes were not detected in the associated samples. The data are Q qualified and are reported as stated in the SOP. See the Form 7A of the data package for the exact recoveries.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
Low Level Calibration Verification Standard EXP1128087 did not meet acceptance criteria of 70-130% for the recovery of HMX at 130.3% and PETN at 138%. The biased high recoveries are an indication that the instrument had more than the required sensitivity to detect the target analytes. Since target analytes were not detected in the associated samples, the data are considered unaffected. The data are Q qualified and are reported with the appropriate DER. See the Form 7B of the data package for the exact recoveries.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS (1203201688) did not meet acceptance criteria for the recovery of HMX at 121%. The limits are 61-118%. Since the HMX recovery was biased high and HMX was not detected in the associated samples, the data are considered unaffected and are reported with the appropriate DER.

**QC Sample Designation**
Client sample 360288007 (WSTMO-14-86605) from SDG 2015-191 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS (1203201689) did not meet acceptance criteria for the recovery of multiple target analytes. Please refer to Form 3 of the data package for a complete list of recoveries. The MSD (1203201690) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD (1203201690) did not meet acceptance criteria for the recovery of multiple target analytes. Please refer to Form 3 of the data package for a complete list of recoveries. The MS (1203201689) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.

**MS/MSD Relative Percent Difference (RPD) Statement**
The MS/MSD pair (1203201689/1203201690) did not meet RPD acceptance criteria for PETN at 21.6%. The limits are 0-20%. Both the MS (1203201689) and MSD (1203201690) recoveries for PETN met acceptance criteria. Since PETN was not detected in the parent sample, 360288007 (WSTMO-14-8660), the data are considered unaffected and are reported with the appropriate DER.

**Internal Standard (ISTD) Acceptance**
A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000.

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

**Technical Information**

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
At the request of the client, a 2x dilution was performed on QC samples 1203201689 (WSTMO-14-86605MS) and 1203201690 (WSTMO-14-86605MSD) prior to the extraction process.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

**Secondary Analyte Analysis**

**Calibration Information**

**Initial Calibration**
All initial calibration requirements for this analysis have been met for this SDG.

**Calibration Verification Standard Requirements**
The following calibration verification standards have not met requirements of 80-120% for this SDG: EXS11200024. The data are Q qualified and are reported as stated in the SOP. See the Form 7A of the data package for the exact recoveries.

**Calibration Blank Requirements**
All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

**CRI Requirements**
Low Level Calibration Verification Standard EXS1128026 did not meet acceptance criteria of 70-130% for the recovery of 2,6-Diamino-4-nitrotoluene at 65.5% and 2,4-Diamino-6-nitrotoluene at 52.4%. The biased low CRI recoveries were confirmed by re-analysis. The data from the first analysis are Q qualified and reported with the appropriate DER. The confirmation raw data are located in the Miscellaneous section of the data package.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG for this analysis met the acceptance criteria.

**Surrogate Recoveries**
All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries were within the established acceptance limits.

**QC Sample Designation**
Client sample 360288007 (WSTMO-14-86605) from SDG 2015-191 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS (1203201689) did not meet acceptance criteria for the recovery of tris(o-cresyl) phosphate at 41.0%. The recovery limits are 44-92%. The MSD (1203201690) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD (1203201690) did not meet acceptance criteria for the recovery of tris(o-cresyl) phosphate at 42.0%. The recovery limits are 44-92%. The MS (1203201689) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPDs between the MS and MSD met the acceptance limits for this analysis.

**Internal Standard (ISTD) Acceptance**
The internal standard was not added to the Secondary analyte extracts.

## Technical Information

**Holding Time Specifications**
All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

**Preparation/Analytical Method Verification**
At the request of the client, a 2x dilution was performed on QC samples 1203201689 (WSTMO-14-86605MS) and 1203201690 (WSTMO-14-86605MSD) prior to the extraction process.

**Sample Dilutions**
In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

**Sample Re-extraction/Re-analysis**
The analytical batch was re-analyzed for the Secondary analytes due to biased low CRI recoveries in the initial analysis. The biased low recoveries were confirmed by the re-analysis. The data from the first analysis are Q qualified and reported with the appropriate DER. The confirmation raw data are located in the Miscellaneous section of the data package.

## Miscellaneous Information

**Data Exception (DER) Documentation**
Data Exception Report 1363622 was generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples required manual integrations due to software limitations.

**Additional Comments**
Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct.

Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data.

## System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LC-MS/MS #1, and LC-MS/MS #2, respectively. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis.

The laboratory also utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC-MS/MS #3 or LC-MS/MS #4. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte analysis.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package.

Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Chromatographic Columns**

The detection of the Primary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

The detection of the Secondary analytes is accomplished through analysis on the following reversed phase column:

YMC: J'sphere ODS-H80, 150 x 4.6mm I.D.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207  GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

Q  One or more quality control criteria have not been met. Refer to the applicable narrative or DER.

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr.  **Name: Michael Penny**

**Date: 15 DEC 2014**  **Title: Group Leader**

# Sample Data Summary

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89229

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 360425005

**Sample Amount** 930 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128080.wiff

**Date Analyzed:** 30-NOV-14 10:59

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.269 | QU | 0.086 | 0.269 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.269 | QU | 0.086 | 0.269 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.269 | QU | 0.086 | 0.269 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.269 | QU | 0.0882 | 0.269 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.269 | QU | 0.086 | 0.269 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.269 | U | 0.086 | 0.269 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.269 | U | 0.086 | 0.269 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.269 | U | 0.086 | 0.269 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.538 | U | 0.086 | 0.538 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89229

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 360425005

**Sample Amount** 930 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.538 | QU | 0.108 | 0.538 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.538 | U | 0.161 | 0.538 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89229

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 360425005

**Sample Amount** 930 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS11280015.wiff

**Date Analyzed:** 28-NOV-14 15:34

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.08 | U | 0.323 | 1.08 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.08 | U | 0.323 | 1.08 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.08 | U | 0.323 | 1.08 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.69 | U | 0.538 | 2.69 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.69 | U | 0.538 | 2.69 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89222

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 360425011

**Sample Amount** 950 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128081.wiff

**Date Analyzed:** 30-NOV-14 11:34

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.263 | QU | 0.0842 | 0.263 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.263 | QU | 0.0842 | 0.263 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.263 | QU | 0.0842 | 0.263 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.263 | QU | 0.0863 | 0.263 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.263 | QU | 0.0842 | 0.263 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.263 | U | 0.0842 | 0.263 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.263 | U | 0.0842 | 0.263 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.263 | U | 0.0842 | 0.263 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.526 | U | 0.0842 | 0.526 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89222

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 360425011

**Sample Amount** 950 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.526 | QU | 0.105 | 0.526 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.526 | U | 0.158 | 0.526 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWR-14-89222

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 360425011

**Sample Amount** 950 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS11280016.wiff

**Date Analyzed:** 28-NOV-14 15:50

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.05 | U | 0.316 | 1.05 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.05 | U | 0.316 | 1.05 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.05 | U | 0.316 | 1.05 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.63 | U | 0.526 | 2.63 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.63 | U | 0.526 | 2.63 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# Quality Control Summary

# High Explosives Surrogate Recovery Summary

**Lab Name:** GEL Laboratories LLC **GEL Job No (SDG):** 2015-207

**Lab Code:** GEL **HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 360425005 | CAWR-14-89229 | 101 | 65 - 114 | |
| 360425011 | CAWR-14-89222 | 95.6 | 65 - 114 | |
| 1203201687 | MB for batch 1433022 | 82 | 65 - 114 | |
| 1203201688 | LCS for batch 1433022 | 82.4 | 65 - 114 | |
| 1203201689 | WSTMO-14-86605MS | 84.8 | 65 - 114 | |
| 1203201690 | WSTMO-14-86605MSD | 89.6 | 65 - 114 | |

DNT = 3,4-Dinitrotoluene

**Lab Code:** GEL **HPLC Column:** YMC J'sphere ODS-H80

| Lab Sample ID | Client Sample ID | DNT | QC Limits | Flg |
|---|---|---|---|---|
| 360425005 | CAWR-14-89229 | 84 | 65 - 114 | |
| 360425011 | CAWR-14-89222 | 84.4 | 65 - 114 | |
| 1203201687 | MB for batch 1433022 | 87.6 | 65 - 114 | |
| 1203201688 | LCS for batch 1433022 | 89.6 | 65 - 114 | |
| 1203201689 | WSTMO-14-86605MS | 90.4 | 65 - 114 | |
| 1203201690 | WSTMO-14-86605MSD | 96 | 65 - 114 | |

DNT = 3,4-Dinitrotoluene

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Extract Batch Code:** 1433022

**Date Extracted:** 05-NOV-14

**GEL LCS ID:** 1203201688

**GEL LCSDUP ID:**

**Analysis Date/Time:** 30-NOV-14 03:24

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec | # | LCSD Conc | LCSD Rec | # | RPD | # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3,5-Trinitrobenzene | 5 | 4.34 | 86.8 | | | | | | | | 70 - 116 |
| 2,4,6-Trinitrotoluene | 5 | 4.25 | 85 | | | | | | | | 71 - 119 |
| 2,4-Dinitrotoluene | 5 | 4.4 | 88 | | | | | | | | 74 - 114 |
| 2-Amino-4,6-dinitrotoluene | 5 | 4.08 | 81.6 | | | | | | | | 71 - 119 |
| HMX | 5 | 6.03 | 121 | * | | | | | | | 61 - 118 |
| PETN | 5 | 4.46 | 89.2 | | | | | | | | 64 - 119 |
| Tetryl | 5 | 3.75 | 75 | | | | | | | | 62 - 117 |
| m-Nitrotoluene | 5 | 3.89 | 77.8 | | | | | | | | 67 - 112 |
| p-Nitrotoluene | 5 | 3.91 | 78.2 | | | | | | | | 65 - 113 |
| o-Nitrotoluene | 5 | 3.84 | 76.8 | | | | | | | | 65 - 111 |
| m-Dinitrobenzene | 5 | 5.17 | 103 | | | | | | | | 73 - 119 |
| RDX | 5 | 4.58 | 91.6 | | | | | | | | 71 - 125 |
| Nitrobenzene | 5 | 3.67 | 73.4 | | | | | | | | 65 - 112 |
| 4-Amino-2,6-dinitrotoluene | 5 | 4.85 | 97 | | | | | | | | 75 - 120 |
| 2,6-Dinitrotoluene | 5 | 4.53 | 90.6 | | | | | | | | 73 - 108 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

**3B**
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Extract Batch Code:** 1433022

**Date Extracted:** 05-NOV-14

**GEL LCS ID:** 1203201688

**GEL LCSDUP ID:**

**Analysis Date/Time:** 20-NOV-14 14:34

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

| Compound | Spike Added | LCS Conc | LCS Rec # | LCSD Conc | LCSD Rec # | RPD # | RPD | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| tris(o-cresyl) phosphate | 5 | 3.49 | 69.8 | | | | | 42 - 89 |
| 2,4-Diamino-6-nitrotoluene | 5 | 3.86 | 77.2 | | | | | 58 - 108 |
| 2,6-Diamino-4-nitrotoluene | 5 | 4.44 | 88.8 | | | | | 65 - 110 |
| 3,5-Dinitroaniline | 5 | 3.97 | 79.4 | | | | | 69 - 118 |
| TATB | 5 | 5.85 | 117 | | | | | 23 - 142 |

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

# High Explosives MS/MSD Summary

**Lab Name:** GEL Laboratories LLC

**Client ID:** WSTMO-14-86605

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Extract Batch Code:** 1433022

**Date Extracted:** 05-NOV-14

**GEL Spike ID:** 1203201689

**GEL SpikeDup ID:** 1203201690

**Analysis Date/Time:** 30-NOV-14 08:04

**MSD Analysis Date/Time:** 30-NOV-14 08:39

**Reporting Units:** ug/L

**QC Type:** MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec | # | MSD Conc | MSD Rec | # | RPD | # | RPD Limit | Rec Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4,6-Trinitrotoluene | 10 | 0 | 9.2 | 92 | | 8.42 | 84.2 | | 8.85 | | 20 | 62 - 125 |
| 2,4-Dinitrotoluene | 10 | 0 | 9.4 | 94 | | 9.8 | 98 | | 4.17 | | 20 | 71 - 119 |
| 2,6-Dinitrotoluene | 10 | 0 | 9.24 | 92.4 | | 9.24 | 92.4 | | 0 | | 20 | 70 - 114 |
| 2-Amino-4,6-dinitrotoluene | 10 | 0 | 8.96 | 89.6 | | 9 | 90 | | .445 | | 20 | 68 - 124 |
| 4-Amino-2,6-dinitrotoluene | 10 | 0 | 10 | 100 | | 10.4 | 104 | | 3.14 | | 20 | 63 - 133 |
| HMX | 10 | 0 | 9.68 | 96.8 | | 9.64 | 96.4 | | .414 | | 20 | 47 - 129 |
| Nitrobenzene | 10 | 0 | 5.5 | 55 | * | 5.74 | 57.4 | | 4.27 | | 20 | 57 - 112 |
| PETN | 10 | 0 | 10.3 | 103 | | 8.28 | 82.8 | | 21.6 | * | 20 | 57 - 121 |
| RDX | 10 | .0398 | 8.2 | 81.6 | | 9.52 | 94.8 | | 14.9 | | 20 | 57 - 136 |
| 1,3,5-Trinitrobenzene | 10 | 0 | 7.42 | 74.2 | | 7.76 | 77.6 | | 4.48 | | 20 | 63 - 121 |
| Tetryl | 10 | 0 | 6.8 | 68 | | 5.98 | 59.8 | | 12.8 | | 60 | 36 - 115 |
| m-Dinitrobenzene | 10 | 0 | 9.62 | 96.2 | | 9.5 | 95 | | 1.26 | | 20 | 69 - 123 |
| m-Nitrotoluene | 10 | 0 | 6.3 | 63 | | 6.52 | 65.2 | | 3.43 | | 20 | 58 - 113 |
| o-Nitrotoluene | 10 | 0 | 5.36 | 53.6 | * | 5 | 50 | * | 6.95 | | 20 | 56 - 113 |
| p-Nitrotoluene | 10 | 0 | 6.26 | 62.6 | | 6.08 | 60.8 | | 2.92 | | 20 | 58 - 114 |

#Column to be used to flag recovery and RPD values with an asterisk

# High Explosives MS/MSD Summary

**Lab Name:** GEL Laboratories LLC

**Client ID:** WSTMO-14-86605

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Extract Batch Code:** 1433022

**Date Extracted:** 05-NOV-14

**GEL Spike ID:** 1203201689

**GEL SpikeDup ID:** 1203201690

**Analysis Date/Time:** 20-NOV-14 15:57

**MSD Analysis Date/Time:** 20-NOV-14 16:14

**Reporting Units:** ug/L

**QC Type:** MS/MSD

| Compound | Spike Added | Sample Conc | MS Conc | MS Rec | # | MSD Conc | MSD Rec | # | RPD | # | RPD Limit | Rec Limits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 10 | 0 | 8.62 | 86.2 | | 8.54 | 85.4 | | .932 | | 20 | 54 - 120 |
| 2,6-Diamino-4-nitrotoluene | 10 | 0 | 9.1 | 91 | | 8.66 | 86.6 | | 4.96 | | 20 | 58 - 117 |
| 3,5-Dinitroaniline | 10 | 0 | 8.68 | 86.8 | | 8.72 | 87.2 | | .46 | | 20 | 68 - 120 |
| TATB | 10 | 1.37 | 14 | 126 | | 14.5 | 132 | | 3.78 | | 20 | 20 - 147 |
| tris(o-cresyl) phosphate | 10 | 0 | 4.1 | 41 | * | 4.2 | 42 | * | 2.41 | | 20 | 44 - 92 |

#Column to be used to flag recovery and RPD values with an asterisk

# Quality Control Data

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201687

**Sample Amount** 1000 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128066.wiff

**Date Analyzed:** 30-NOV-14 02:49

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 0.250 | U | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 0.250 | QU | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 0.250 | QU | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 88-72-2 | o-Nitrotoluene | 0.250 | U | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 0.250 | QU | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | 0.250 | U | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 0.250 | U | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 479-45-8 | Tetryl | 0.500 | U | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201687

**Sample Amount** 1000 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-11-5 | PETN | 0.500 | U | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | 0.500 | U | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** MB for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201687

**Sample Amount** 1000 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS11200014.wiff

**Date Analyzed:** 20-NOV-14 14:17

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 3058-38-6 | TATB | 1.00 | U | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 1.00 | U | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | 1.00 | U | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 2.50 | QU | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 2.50 | QU | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201688

**Sample Amount** 1000 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128067.wiff

**Date Analyzed:** 30-NOV-14 03:24

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 98-95-3 | Nitrobenzene | 3.67 | Q | 0.080 | 0.250 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 479-45-8 | Tetryl | 3.75 | | 0.080 | 0.500 |
| *479-45-8* | *Tetryl* | | | | |
| 88-72-2 | o-Nitrotoluene | 3.84 | | 0.082 | 0.250 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 3.89 | | 0.080 | 0.250 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-99-0 | p-Nitrotoluene | 3.91 | | 0.150 | 0.500 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 4.08 | | 0.080 | 0.250 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 4.25 | | 0.080 | 0.250 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 4.34 | | 0.080 | 0.250 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 4.4 | | 0.080 | 0.250 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 78-11-5 | PETN | 4.46 | | 0.100 | 0.500 |
| *78-11-5* | *PETN* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 4.53 | | 0.080 | 0.250 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 121-82-4 | RDX | 4.58 | | 0.080 | 0.250 |
| *121-82-4* | *RDX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 4.85 | Q | 0.080 | 0.250 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201688

**Sample Amount** 1000 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 99-65-0 | m-Dinitrobenzene | 5.17 | | 0.080 | 0.250 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 2691-41-0 | HMX | 6.03 | Q | 0.080 | 0.250 |
| *2691-41-0* | *HMX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** LCS for batch 1433022

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201688

**Sample Amount** 1000 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS11200015.wiff

**Date Analyzed:** 20-NOV-14 14:34

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 3.49 | | 0.300 | 1.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 3.86 | Q | 0.500 | 2.50 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 3.97 | | 0.300 | 1.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 4.44 | Q | 0.500 | 2.50 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 3058-38-6 | TATB | 5.85 | | 0.300 | 1.00 |
| *3058-38-6* | *TATB* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201689

**Sample Amount** 500 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128075.wiff

**Date Analyzed:** 30-NOV-14 08:04

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 88-72-2 | o-Nitrotoluene | 5.36 | Q | 0.164 | 0.500 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 5.5 | Q | 0.160 | 0.500 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-99-0 | p-Nitrotoluene | 6.26 | | 0.300 | 1.00 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 6.3 | | 0.160 | 0.500 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 479-45-8 | Tetryl | 6.8 | | 0.160 | 1.00 |
| *479-45-8* | *Tetryl* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 7.42 | | 0.160 | 0.500 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 121-82-4 | RDX | 8.2 | Q | 0.160 | 0.500 |
| *121-82-4* | *RDX* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 8.96 | | 0.160 | 0.500 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 9.2 | | 0.160 | 0.500 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 9.24 | | 0.160 | 0.500 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | 9.4 | | 0.160 | 0.500 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 9.62 | | 0.160 | 0.500 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 2691-41-0 | HMX | 9.68 | Q | 0.160 | 0.500 |
| *2691-41-0* | *HMX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201689

**Sample Amount** 500 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 10 | Q | 0.160 | 0.500 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 78-11-5 | PETN | 10.3 | Q | 0.200 | 1.00 |
| *78-11-5* | *PETN* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MS)MS

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201689

**Sample Amount** 500 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

**GEL data file:** EXS11200020.wiff

**Date Analyzed:** 20-NOV-14 15:57

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 4.1 | | 0.600 | 2.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 8.62 | Q | 1.00 | 5.00 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 8.68 | | 0.600 | 2.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 9.1 | Q | 1.00 | 5.00 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 3058-38-6 | TATB | 14 | | 0.600 | 2.00 |
| *3058-38-6* | *TATB* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201690

**Sample Amount** 500 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1128076.wiff

**Date Analyzed:** 30-NOV-14 08:39

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 88-72-2 | o-Nitrotoluene | 5 | Q | 0.164 | 0.500 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | 5.74 | Q | 0.160 | 0.500 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 479-45-8 | Tetryl | 5.98 | | 0.160 | 1.00 |
| *479-45-8* | *Tetryl* | | | | |
| 99-99-0 | p-Nitrotoluene | 6.08 | | 0.300 | 1.00 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 99-08-1 | m-Nitrotoluene | 6.52 | | 0.160 | 0.500 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 7.76 | | 0.160 | 0.500 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 78-11-5 | PETN | 8.28 | Q | 0.200 | 1.00 |
| *78-11-5* | *PETN* | | | | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 8.42 | | 0.160 | 0.500 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | 9 | | 0.160 | 0.500 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | 9.24 | | 0.160 | 0.500 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 99-65-0 | m-Dinitrobenzene | 9.5 | | 0.160 | 0.500 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 121-82-4 | RDX | 9.52 | Q | 0.160 | 0.500 |
| *121-82-4* | *RDX* | | | | |
| 2691-41-0 | HMX | 9.64 | Q | 0.160 | 0.500 |
| *2691-41-0* | *HMX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201690

**Sample Amount** 500 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 121-14-2 | 2,4-Dinitrotoluene | 9.8 | | 0.160 | 0.500 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 10.4 | Q | 0.160 | 0.500 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** WSTMO-14-86605(360288007MSD)MSD

**Lab Code:** GEL

**GEL Job No (SDG)** 2015-207

**Matrix:** WATER

**GEL Sample ID:** 1203201690

**Sample Amount** 500 mL

**Date Received:** 04-NOV-14

**Moisture:**

**Extraction Batch ID:** 1433022

**Extraction Type** Sol Exchange

**Date Extracted:** 05-NOV-14

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXS11200021.wiff

**Date Analyzed:** 20-NOV-14 16:14

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 78-30-8 | tris(o-cresyl) phosphate | 4.2 | | 0.600 | 2.00 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | 8.54 | Q | 1.00 | 5.00 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | 8.66 | Q | 1.00 | 5.00 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | 8.72 | | 0.600 | 2.00 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 3058-38-6 | TATB | 14.5 | | 0.600 | 2.00 |
| *3058-38-6* | *TATB* | | | | |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 28-NOV-14 12:57

**GEL Data File:** EXP1128001.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 28-NOV-14 13:32

**GEL Data File:** EXP1128002.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 20-NOV-14 10:40

**GEL Data File:** EXS11200001.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 3.13 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.55 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 20-NOV-14 10:57

**GEL Data File:** EXS11200002.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | .898 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 28-NOV-14 11:40

**GEL Data File:** EXS11280001.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 4.65 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.36 |

# Explosives Initial Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK01

**Analysis Date:** 28-NOV-14 11:56

**GEL Data File:** EXS11280002.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 2.95 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 28-NOV-14 17:37

**GEL Data File:** EXP1128009.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 28-NOV-14 18:47

**GEL Data File:** EXP1128011.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 28-NOV-14 22:17

**GEL Data File:** EXP1128017.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 29-NOV-14 02:22

**GEL Data File:** EXP1128024.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK06

**Analysis Date:** 29-NOV-14 06:26

**GEL Data File:** EXP1128031.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 3.57 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 29-NOV-14 08:46

**GEL Data File:** EXP1128035.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 1.85 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK08

**Analysis Date:** 29-NOV-14 09:56

**GEL Data File:** EXP1128037.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK09

**Analysis Date:** 29-NOV-14 12:51

**GEL Data File:** EXP1128042.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 1.05 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK10

**Analysis Date:** 29-NOV-14 15:10

**GEL Data File:** EXP1128046.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 1.6 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK11

**Analysis Date:** 29-NOV-14 17:30

**GEL Data File:** EXP1128050.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK12

**Analysis Date:** 29-NOV-14 23:20

**GEL Data File:** EXP1128060.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK13

**Analysis Date:** 30-NOV-14 02:15

**GEL Data File:** EXP1128065.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK14

**Analysis Date:** 30-NOV-14 06:54

**GEL Data File:** EXP1128073.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK15

**Analysis Date:** 30-NOV-14 14:29

**GEL Data File:** EXP1128086.wiff

**Instrument ID:** LCMSMS3

**Column:** Ultracarb Phenomenex 5u ODS (20)

| Compound | True | Found (ug/L) |
|---|---|---|
| Nitrobenzene | 0 | 0 |
| Nitroglycerin | 0 | 0 |
| PETN | 0 | 0 |
| RDX | 0 | 0 |
| Tetryl | 0 | 0 |
| m-Dinitrobenzene | 0 | 0 |
| m-Nitrotoluene | 0 | 0 |
| o-Nitrotoluene | 0 | 0 |
| p-Nitrotoluene | 0 | 0 |
| 3,4-Dinitrotoluene | 0 | 0 |
| DNX | 0 | 0 |
| MNX | 0 | 0 |
| TNX | 0 | 0 |
| 1,3,5-Trinitrobenzene | 0 | 0 |
| 2,4,6-Trinitrotoluene | 0 | 0 |
| 2,4-Dinitrotoluene | 0 | 0 |
| 2,6-Dinitrotoluene | 0 | 0 |
| 2-Amino-4,6-dinitrotoluene | 0 | 0 |
| 4-Amino-2,6-dinitrotoluene | 0 | 0 |
| HMX | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 20-NOV-14 13:10

**GEL Data File:** EXS11200010.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 11.2 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 2.75 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 20-NOV-14 13:44

**GEL Data File:** EXS11200012.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 6.5 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.6 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 20-NOV-14 17:21

**GEL Data File:** EXS11200025.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 5.63 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.73 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 28-NOV-14 14:10

**GEL Data File:** EXS11280010.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 11.1 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 2.18 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 28-NOV-14 14:44

**GEL Data File:** EXS11280012.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 5.71 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 1.07 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 28-NOV-14 16:57

**GEL Data File:** EXS11280020.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 0 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | 0 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

**4A**
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2015-207

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 28-NOV-14 17:31

**GEL Data File:** EXS11280022.wiff

**Instrument ID:** LCMSMS4

**Column:** YMC J'sphere ODS-H80

| Compound | True | Found (ug/L) |
|---|---|---|
| 3,4-Dinitrotoluene | 0 | 0 |
| tris(o-cresyl) phosphate | 0 | 3.46 |
| TATB | 0 | 0 |
| 3,5-Dinitroaniline | 0 | .888 |
| 2,4-Diamino-6-nitrotoluene | 0 | 0 |
| 2,6-Diamino-4-nitrotoluene | 0 | 0 |

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 10-DEC-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LC-MS/MS | SW846 3535/8321A Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1433023 | See Below | | |

**Potentially affected work order(s)(SDG):** **360220(2015-187),360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189),360424(2015-204),360425(2015-207),360431(2015-208)**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Low Level Calibration Verification Standard EXP1128087 did not meet acceptance criteria of 70-130% for the recovery of HMX at 130.3% and PETN at 138%. | 1. The biased high recoveries are an indication that the instrument had more than the required sensitivity to detect the target analytes. Since these target analytes were not detected in the associated samples, the data are considered unaffected. The data are Q qualified and reported with the appropriate DER. The discrepancies are noted in the Case Narrative. |
| 2. Low Level Calibration Verification Standard EXS1128026 did not meet acceptance criteria of 70-130% for the recovery of 2,6-Diamino-4-nitrotoluene at 65.5% and 2,4-Diamino-6-nitrotoluene at 52.4%. | 2. The biased low CRI recoveries were confirmed by re-analysis. The data from the first analysis are Q qualified and reported with the appropriate DER. The confirmation raw data are located in the Miscellaneous section of the data package. The discrepancies are noted in the Case Narrative. |
| 3. The LCS (1203201688) did not meet acceptance criteria for the recovery of HMX at 121%. The limits are 61-118%. | 3. Since the HMX recovery was biased high and HMX was not detected in the associated samples, the data are considered unaffected and are reported with the appropriate DER. |
| 4. The MS (1203201689) did not meet acceptance criteria for the recovery of multiple target analytes. Please refer to Form 3 of the data package for a complete list of recoveries. | 4. The MSD (1203201690) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER. |
| 5. The MSD (1203201690) did not meet acceptance criteria for the recovery of multiple target analytes. Please refer to Form 3 of the data package for a complete list of recoveries. | 5. The MS (1203201689) confirmed the low recoveries which are attributed to sample matrix interference. The data are reported with the appropriate DER. |
| 6. The MS/MSD pair (1203201689/1203201690) did not meet RPD acceptance criteria for PETN at 21.6%. The limits are 0-20%. | 6. Both the MS (1203201689) and MSD (1203201690) recoveries for PETN met acceptance criteria. Since PETN was not detected in the parent sample, 360288007 (WSTMO-14-8660), the data are considered unaffected and are reported with the appropriate DER. |

**Originator's Name:**

Lynne Russell 10-DEC-14

**Data Validator/Group Leader:**

Michael Penny 11-DEC-14

# Pesticide Analysis

# Case Narrative

**Pesticide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water by GC/ECD Using Methods 504.1 or 8011** |
| Analytical Method: | SW846 8011 |
| Prep Method: | SW846 8011 PREP |
| Analytical Batch Number: | 1433586 |
| Prep Batch Number: | 1433585 |

## Sample Analysis

| Sample ID | Client ID |
|---|---|
| 360425001 | CAWR-14-89229 |
| 360425007 | CAWR-14-89222 |
| 360425014 | CAWR-14-89225 |
| 1203203092 | MB for batch 1433585 |
| 1203203093 | Laboratory Control Sample (LCS) |
| 1203203094 | Laboratory Control Sample Duplicate (LCSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-059 REV# 13.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for this analytical batch for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The laboratory control sample (LCS) spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD values between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike (MS) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Matrix Spike Duplicate (MSD) Recovery Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**MS/MSD Relative Percent Difference (RPD) Statement**
Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

**Technical Information:**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG in this analytical batch met the specified holding time.

**Sample preservation**
Samples had a pH of 2. 360425014 (CAWR-14-89225).

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

**Sample Dilutions**
The samples in this SDG in this analytical batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

**Miscellaneous Information:**

**Electronic Package Comment**

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

**Data Exception (DER) Documentation**
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this batch for this SDG.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

**Additional Comments**
The higher value is reported.

**System Configuration**

The 504.1/8011 analysis of EDB/DBCP was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP I | 30m x 0.25mm, 0.25um (Rtx-CLPesticide) |
| ECD1A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-50-504/8011 | 30m x 0.53mm, 1.00um |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | Rtx-CLP II | 30m x 0.25mm, 0.20um (Rtx-CLPesticide II) |
| ECD1A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series ECD | ZB-XLB-504/8 | 30m x 0.53mm, 1.50um |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207  GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Cameron Bearden  **Name: Cameron Bearden**

**Date: 26 NOV 2014**  **Title: Group Leader**

# Sample Data Summary

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425001** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1433586** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 19:40** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/10/2014 10:50** | **Aliquot:** | **34.56 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **111014HE\E1K1023.D** | **Column:** | **1 ZB-50** | | |
| | **111014HE\E1K1023.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0203 | ug/L | 0.00608 | 0.0203 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0203 | ug/L | 0.00608 | 0.0203 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.99 | 3.62 | ug/L | 110 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425007** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1433586** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 20:01** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/10/2014 10:50** | **Aliquot:** | **35.34 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **111014HE\E1K1024.D** | **Column:** | **1 ZB-50** | | |
| | **111014HE\E1K1024.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0198 | ug/L | 0.00594 | 0.0198 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0198 | ug/L | 0.00594 | 0.0198 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 3.78 | 3.54 | ug/L | 107 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425014** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **EDB_DBCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89225** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1433586** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 20:23** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/10/2014 10:50** | **Aliquot:** | **34.43 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **111014HE\E1K1025.D** | **Column:** | **1 ZB-50** | | |
| | **111014HE\E1K1025.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.0203 | ug/L | 0.0061 | 0.0203 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.0203 | ug/L | 0.0061 | 0.0203 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 5.20 | 3.63 | ug/L | 143 | (56%-145%) |

# Quality Control Summary

**Pesticide**

## Surrogate Recovery Report

**SDG Number: 2015-207**

**Matrix Type: LIQUID**

| Sample ID | Client ID | BFB 1 %REC # | BFB 2 %REC # |
|---|---|---|---|
| 1203203092 | MB for batch 1433585 | 116 | 131 |
| 1203203093 | LCS for batch 1433585 | 110 | 127 |
| 1203203094 | LCSD for batch 1433585 | 110 | 124 |
| 360425001 | CAWR-14-89229 | 103 | 110 |
| 360425007 | CAWR-14-89222 | 101 | 107 |
| 360425014 | CAWR-14-89225 | 121 | 143 |

| Surrogate | Acceptance Limits |
|---|---|
| BFB = Bromofluorobenzene | (56%-145%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1433585**
**Lab Sample ID** **1203203093**
**Instrument:** **ECD1A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 14:11**
**Prep Batch ID:** **1433585**
**Batch ID:** **1433586**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 106-93-4 | LCS | 1,2-Dibromoethane | 0.200 | 0.0 | 0.236 | 118 | 70-130 |
| 96-12-8 | LCS | 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.229 | 114 | 70-130 |

**Pesticide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCSD for batch 1433585**
**Lab Sample ID** **1203203094**
**Instrument:** **ECD1A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **11/10/2014 14:32**
**Dilution: 1**
**Prep Batch ID:** **1433585**
**Batch ID:** **1433586**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 106-93-4 | LCSD 1,2-Dibromoethane | 0.200 | 0.0 | 0.236 | 118 | 70-130 | 0 | 0-20 |
| 96-12-8 | LCSD 1,2-Dibromo-3-chloropropane | 0.200 | 0.0 | 0.229 | 115 | 70-130 | 0 | 0-20 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1433585** | **Instrument ID:** | **ECD1A.I_1**<br>**ECD1A.I_2** | **Data File:** | **111014HE\E1K1007.D**<br>**111014HE\E1K1007.D** |
| **Lab Sample ID:** | **1203203092** | | | | |
| **Column:** | **ZB-50**<br>**ZB-XLB** | **Prep Date:** | **11/10/2014 10:50** | **Analyzed:** | **11/10/14 13:50** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1433585** | **1203203093** | **111014HE\E1K1008.D**<br>**111014HE\E1K1008.D** | **11/10/14** | **1411** |
| **02 LCSD for batch 1433585** | **1203203094** | **111014HE\E1K1009.D**<br>**111014HE\E1K1009.D** | **11/10/14** | **1432** |
| **03 CAWR-14-89229** | **360425001** | **111014HE\E1K1023.D**<br>**111014HE\E1K1023.D** | **11/10/14** | **1940** |
| **04 CAWR-14-89222** | **360425007** | **111014HE\E1K1024.D**<br>**111014HE\E1K1024.D** | **11/10/14** | **2001** |
| **05 CAWR-14-89225** | **360425014** | **111014HE\E1K1025.D**<br>**111014HE\E1K1025.D** | **11/10/14** | **2023** |

# Quality Control Data

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203092** | | | | |
| **Client Sample:** | **QC for batch 1433585** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1433585** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1433586** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 13:50** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/10/2014 10:50** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **111014HE\E1K1007.D** | **Column:** | **1 ZB-50** | | |
| | **111014HE\E1K1007.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | U | 0.020 | ug/L | 0.006 | 0.020 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.67 | 3.57 | ug/L | 131 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203093** | | | | |
| **Client Sample:** | **QC for batch 1433585** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1433585** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1433586** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 14:11** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/10/2014 10:50** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **111014HE\E1K1008.D** | **Column:** | **1 ZB-50** | | |
| | **111014HE\E1K1008.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.229 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.236 | ug/L | 0.006 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.52 | 3.57 | ug/L | 127 | (56%-145%) |

# Pesticide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203094** | | | | |
| **Client Sample:** | **QC for batch 1433585** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1433585** | **Method:** | **SW846 8011** | **SOP Ref:** | **GL-OA-E-059** |
| **Batch ID:** | **1433586** | **Inst:** | **ECD1A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/10/2014 14:32** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/10/2014 10:50** | **Aliquot:** | **35 mL** | **Final Volume:** | **35 mL** |
| **Data File:** | **111014HE\E1K1009.D** | **Column:** | **1 ZB-50** | | |
| | **111014HE\E1K1009.D** | | **2 ZB-XLB** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 96-12-8 | 1,2-Dibromo-3-chloropropane | | 0.229 | ug/L | 0.006 | 0.020 | 1 |
| 106-93-4 | 1,2-Dibromoethane | | 0.236 | ug/L | 0.006 | 0.020 | 2 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| Bromofluorobenzene | 4.43 | 3.57 | ug/L | 124 | (56%-145%) |

# Miscellaneous

# PCB Analysis

# Case Narrative

**PCB Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Polychlorinated Biphenyls by ECD** |
| Analytical Method: | SW846 3535A/8082 |
| Prep Method: | SW846 3535A |
| Analytical Batch Number: | 1439239 |
| Prep Batch Number: | 1439235 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

| Sample ID | Client ID |
|---|---|
| 360425002 | CAWR-14-89229 |
| 360425008 | CAWR-14-89222 |
| 1203217926 | MB for batch 1439235 |
| 1203217927 | Laboratory Control Sample (LCS) |
| 1203217928 | 360424002(CAPA-14-87182) Matrix Spike (MS) |
| 1203217929 | 360424002(CAPA-14-87182) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**
Sample 360424002 (CAPA-14-87182) was selected for the matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
The MSD recoveries for this SDG were within the established acceptance limits.

**MS/MSD Relative Percent Difference (RPD) Statement**
The RPD between the MS and MSD met the acceptance limits.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina.

**Sample Dilutions**
The samples in this SDG in this batch did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this batch.

## Miscellaneous Information

**Electronic Package Comment**

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

**Manual Integrations**
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS and MSD are from the same analytical column as the parent sample.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

**System Configuration**

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD9A.I_1 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 1 | 30m x 0.25mm, 0.25um |
| ECD9A.I_2 | Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler | 7890A GC/ECD | Restek Rtx-CLPest 2 | 30m x 0.25mm, 0.20um |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 − (843) 556−8171 − www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS−LANS−MTOA6−25093−GEL)

Client SDG: 2015−207 GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re−analyzed without re−extraction.
RE Indicates that sample is re−extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Cameron Bearden **Name: Cameron Bearden**

**Date: 28 NOV 2014** **Title: Group Leader**

# Sample Data Summary

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425002** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1439239** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/27/2014 15:57** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/26/2014 11:15** | **Aliquot:** | **930 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **112714.S\E9k2719.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **112714.S\E9k2719.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.108 | ug/L | 0.0358 | 0.108 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.108 | ug/L | 0.0358 | 0.108 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.108 | ug/L | 0.0358 | 0.108 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.108 | ug/L | 0.0358 | 0.108 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.108 | ug/L | 0.0358 | 0.108 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.108 | ug/L | 0.0358 | 0.108 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.108 | ug/L | 0.0358 | 0.108 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.108 | ug/L | 0.0358 | 0.108 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.175 | 0.215 | ug/L | 81.2 | (33%-102%) |
| Decachlorobiphenyl | 0.223 | 0.215 | ug/L | 103 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425008** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **PCB** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1439239** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/27/2014 16:08** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/26/2014 11:15** | **Aliquot:** | **990 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **112714.S\E9k2720.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **112714.S\E9k2720.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.101 | ug/L | 0.0336 | 0.101 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.167 | 0.202 | ug/L | 82.9 | (33%-102%) |
| Decachlorobiphenyl | 0.213 | 0.202 | ug/L | 105 | (33%-125%) |

# Quality Control Summary

**PCB**

## Surrogate Recovery Report

**SDG Number: 2015-207**

**Matrix Type: LIQUID**

| Sample ID | Client ID | 4CMX 1 %REC # | 4CMX 2 %REC # | DCB 1 %REC # | DCB 2 %REC # |
|---|---|---|---|---|---|
| 1203217926 | MB for batch 1439235 | 71 | 77 | 85 | 94 |
| 1203217927 | LCS for batch 1439235 | 80 | 85 | 93 | 103 |
| 1203217928 | CAPA-14-87182MS | 70 | 75 | 88 | 94 |
| 1203217929 | CAPA-14-87182MSD | 81 | 87 | 94 | 104 |
| 360425002 | CAWR-14-89229 | 75 | 81 | 93 | 103 |
| 360425008 | CAWR-14-89222 | 76 | 83 | 95 | 105 |

| Surrogate | | Acceptance Limits |
|---|---|---|
| 4CMX | = 4cmx | (33%-102%) |
| DCB | = Decachlorobiphenyl | (33%-125%) |

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1439235**
**Lab Sample ID** **1203217927**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/27/2014 14:49**
**Dilution: 1**
**Prep Batch ID:** **1439235**
**Batch ID:** **1439239**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | LCS | Aroclor-1016 | 1.00 | 0.0 | 0.764 | 76 | 47-105 |
| 11096-82-5 | LCS | Aroclor-1260 | 1.00 | 0.0 | 0.772 | 77 | 45-108 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87182MS**
**Lab Sample ID** **1203217928**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/27/2014 15:12**
**Prep Batch ID:** **1439235**
**Batch ID:** **1439239**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MS | Aroclor-1016 | 1.05 | 0.00 | U | 0.693 | 66 | 32-108 |
| 11096-82-5 | MS | Aroclor-1260 | 1.05 | 0.00 | U | 0.748 | 71 | 29-110 |

**PCB**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87182MSD**
**Lab Sample ID** **1203217929**
**Instrument:** **ECD9A.I**
**Analyst:** **YS1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike Duplicate**
**Matrix:** **W**
**Analysis Date:** **11/27/2014 15:23**
**Prep Batch ID:** **1439235**
**Batch ID:** **1439239**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|---|---|
| 12674-11-2 | MSD | Aroclor-1016 | 1.05 | 0.00 | U | 0.781 | 74 | 32-108 | 12 | 0-30 |
| 11096-82-5 | MSD | Aroclor-1260 | 1.05 | 0.00 | U | 0.825 | 78 | 29-110 | 10 | 0-30 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1439235** | **Instrument ID:** | **ECD9A.I_1**<br>**ECD9A.I_2** | **Data File:** | **112714.S\E9k2712.D**<br>**112714.S\E9k2712.D** |
| **Lab Sample ID:** | **1203217926** | | | | |
| **Column:** | **RTX-CLPEST 1**<br>**RTX-CLPEST 2** | **Prep Date:** | **11/26/2014 11:15** | **Analyzed:** | **11/27/14 14:38** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| **01 LCS for batch 1439235** | **1203217927** | **112714.S\E9k2713.D**<br>**112714.S\E9k2713.D** | **11/27/14** | **1449** |
| **02 CAPA-14-87182MS** | **1203217928** | **112714.S\E9k2715.D**<br>**112714.S\E9k2715.D** | **11/27/14** | **1512** |
| **03 CAPA-14-87182MSD** | **1203217929** | **112714.S\E9k2716.D**<br>**112714.S\E9k2716.D** | **11/27/14** | **1523** |
| **04 CAWR-14-89229** | **360425002** | **112714.S\E9k2719.D**<br>**112714.S\E9k2719.D** | **11/27/14** | **1557** |
| **05 CAWR-14-89222** | **360425008** | **112714.S\E9k2720.D**<br>**112714.S\E9k2720.D** | **11/27/14** | **1608** |

# Quality Control Data

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203217926** | | | | |
| **Client Sample:** | **QC for batch 1439235** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1439235** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1439239** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/27/2014 14:38** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/26/2014 11:15** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **112714.S\E9k2712.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **112714.S\E9k2712.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.154 | 0.200 | ug/L | 76.9 | (33%-102%) |
| Decachlorobiphenyl | 0.188 | 0.200 | ug/L | 93.8 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203217927** | | | | |
| **Client Sample:** | **QC for batch 1439235** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1439235** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1439239** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/27/2014 14:49** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/26/2014 11:15** | **Aliquot:** | **1000 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **112714.S\E9k2713.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **112714.S\E9k2713.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.764 | ug/L | 0.0333 | 0.100 | 2 |
| 11104-28-2 | Aroclor-1221 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.772 | ug/L | 0.0333 | 0.100 | 2 |
| 37324-23-5 | Aroclor-1262 | U | 0.100 | ug/L | 0.0333 | 0.100 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.170 | 0.200 | ug/L | 85.2 | (33%-102%) |
| Decachlorobiphenyl | 0.206 | 0.200 | ug/L | 103 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/31/2014 15:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203217928** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **QC for batch 1439235** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAPA-14-87182MS** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1439239** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/27/2014 15:12** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/26/2014 11:15** | **Aliquot:** | **950 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **112714.S\E9k2715.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **112714.S\E9k2715.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.693 | ug/L | 0.0351 | 0.105 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.748 | ug/L | 0.0351 | 0.105 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.159 | 0.211 | ug/L | 75.4 | (33%-102%) |
| Decachlorobiphenyl | 0.197 | 0.211 | ug/L | 93.7 | (33%-125%) |

# PCB
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/31/2014 15:05** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203217929** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **QC for batch 1439235** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAPA-14-87182MSD** | **Method:** | **SW846 3535A/8082** | **SOP Ref:** | **GL-OA-E-040** |
| **Batch ID:** | **1439239** | **Inst:** | **ECD9A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/27/2014 15:23** | **Analyst:** | **YS1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/26/2014 11:15** | **Aliquot:** | **950 mL** | **Final Volume:** | **1 mL** |
| **Data File:** | **112714.S\E9k2716.D** | **Column:** | **1 RTX-CLPEST 1** | | |
| | **112714.S\E9k2716.D** | | **2 RTX-CLPEST 2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 12674-11-2 | Aroclor-1016 | | 0.781 | ug/L | 0.0351 | 0.105 | 1 |
| 11104-28-2 | Aroclor-1221 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11141-16-5 | Aroclor-1232 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 53469-21-9 | Aroclor-1242 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 12672-29-6 | Aroclor-1248 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11097-69-1 | Aroclor-1254 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |
| 11096-82-5 | Aroclor-1260 | | 0.825 | ug/L | 0.0351 | 0.105 | 1 |
| 37324-23-5 | Aroclor-1262 | U | 0.105 | ug/L | 0.0351 | 0.105 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 4cmx | 0.183 | 0.211 | ug/L | 87.1 | (33%-102%) |
| Decachlorobiphenyl | 0.220 | 0.211 | ug/L | 104 | (33%-125%) |

# Herbicide Analysis

# Case Narrative

**Herbicide Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

| | |
|---|---|
| **Procedure:** | **Analysis of Chlorophenoxy Acid Herbicides by ECD** |
| Analytical Method: | SW846 8151A |
| Prep Method: | SW846 8151A |
| Analytical Batch Number: | 1433733 |
| Prep Batch Number: | 1433729 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8151A:

| Sample ID | Client ID |
|---|---|
| 360425006 | CAWR-14-89229 |
| 360425012 | CAWR-14-89222 |
| 1203203431 | MB for batch 1433729 |
| 1203203432 | Laboratory Control Sample (LCS) |
| 1203203437 | Laboratory Control Sample Duplicate (LCSD) |
| 1203203433 | 360431006(CAPA-14-87204) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

## Preparation/Analytical Method Verification

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-011 REV# 21.

Raw data reports are processed and reviewed by the analyst using ChemStation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

## Calibration Information

**Initial Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**Continuing Calibration Verification (CCV) Requirements**
All Initial Calibration Verification (ICV) requirements have been met for this SDG. However, not all Calibration Verification Standards (CCV) requirements were met. Pentachlorophenol and the surrogate failed acceptance criteria with a positive bias on one analytical column in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. Since the target analytes were not detected in the samples 360425006 (CAWR-14-89229) and 360425012

(CAWR-14-89222) and all surrogate recoveries met acceptance criteria in the associated client samples, the non-compliance had no adverse impact on the data. All analytes were within the established retention time windows for this method.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Surrogate Recoveries**
All surrogate recoveries were within the established acceptance criteria for this SDG.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Laboratory Control Sample Duplicate (LCSD) Recovery**
The LCSD spike recoveries met the acceptance limits.

**LCS/LCSD Relative Percent Difference (RPD) Statement**
The RPD(s) between the LCS and LCSD met the acceptance limits.

**QC Sample Designation**
Sample 360431006 (CAPA-14-87204) was selected for analysis as the matrix spike. A matrix spike duplicate was not extracted or analyzed with this batch. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**Matrix Spike (MS) Recovery Statement**
The MS recoveries for this SDG were within the established acceptance limits.

**Matrix Spike Duplicate (MSD) Recovery Statement**
There was no matrix spike duplicate extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

**MS/MSD Relative Percent Difference (RPD) Statement**
There are no reportable MS/MSD RDP values since a MSD was not extracted and analyzed with this batch, only a matrix spike. A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

## Technical Information

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported target analyte concentrations were confirmed on a dissimilar column.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-extraction/Re-analysis**
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or

dilutions were required.

**Miscellaneous Information**

**Electronic Package Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this Herbicide fraction.

**Additional Comments**
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS are from the same analytical column as the parent sample. The data reported for the LCSD are from the same analytical column as the LCS.

Due to rounding differences in the calculation between the forms, the data reported in the Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

**System Configuration**

The Semi-Volatiles-HERB analysis was performed on the following instrument configuration:

| Instrument ID | Instrument | System Configuration | Column ID | Column Description |
|---|---|---|---|---|
| ECD6A.I_1 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series GC/ECD | Rtx-CLP I | 30m x 0.32mm, 0.50um (Rtx-CLPesticide) |

| | | | | |
|---|---|---|---|---|
| ECD6A.I_2 | Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler | HP6890 Series GC/ECD | Rtx-CLP II | 30m x 0.32mm, 0.50um (Rtx-CLPesticide II) |

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207  GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a surrogate compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

DL  Indicates that sample is diluted.
RA  Indicates that sample is re-analyzed without re-extraction.
RE  Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Barbara Bailey  **Name: Barbara Bailey**

**Date: 25 NOV 2014**  **Title: Data Validator**

# Sample Data Summary

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425006** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89229** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1433733** | **Inst:** | **ECD6A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 19:55** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 04:50** | **Aliquot:** | **950 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **110614\E6k0618.D** | **Column:** | **1 CLP** | | |
| | **110614\E6k0618.D** | | **2 CLP2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.263 | ug/L | 0.0877 | 0.263 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.58 | 5.26 | ug/L | 106 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 13:40** | **Matrix:** | **W** |
| **Lab Sample ID:** | **360425012** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **PCP** | **Client:** | **ARSL004** | **Project:** | **ESHL00714** |
| **Client ID:** | **CAWR-14-89222** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1433733** | **Inst:** | **ECD6A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 20:23** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 04:50** | **Aliquot:** | **950 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **110614\E6k0619.D** | **Column:** | **1 CLP** | | |
| | **110614\E6k0619.D** | | **2 CLP2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.263 | ug/L | 0.0877 | 0.263 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 6.25 | 5.26 | ug/L | 119 | (40%-138%) |

# Quality Control Summary

**Herbicide**

## Surrogate Recovery Report

**SDG Number: 2015-207**

**Matrix Type: LIQUID**

| Sample ID | Client ID | DCAA 1 %REC # | DCAA 2 %REC # |
|---|---|---|---|
| 1203203431 | MB for batch 1433729 | 103 | 84 |
| 1203203432 | LCS for batch 1433729 | 117 | 105 |
| 1203203437 | LCSD for batch 1433729 | 120 | 115 |
| 360425006 | CAWR-14-89229 | 106 | 89 |
| 360425012 | CAWR-14-89222 | 119 | 90 |
| 1203203433 | CAPA-14-87204MS | 138 | 121 |

| Surrogate | Acceptance Limits |
|---|---|
| DCAA = 2,4-Dichlorophenylacetic acid | (40%-138%) |

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCS for batch 1433729**
**Lab Sample ID** **1203203432**
**Instrument:** **ECD6A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample**
**Matrix:** **WATER**
**Analysis Date:** **11/06/2014 18:32**
**Prep Batch ID:** **1433729**
**Batch ID:** **1433733**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|
| 87-86-5 | LCS | Pentachlorophenol | 2.00 | 0.0 | 1.83 | 91 | 55-113 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **LCSD for batch 1433729**
**Lab Sample ID** **1203203437**
**Instrument:** **ECD6A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Laboratory Control Sample Duplicate**
**Matrix:** **WATER**
**Analysis Date:** **11/06/2014 18:59**
**Dilution: 1**
**Prep Batch ID:** **1433729**
**Batch ID:** **1433733**

| CAS No | Parmname | Amount Added ug/L | Sample Conc. ug/L | Spike Conc. ug/L | Recovery % | Acceptance Limits | RPD % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | LCSD Pentachlorophenol | 2.00 | 0.0 | 1.89 | 95 | 55-113 | 4 | 0-30 |

**Herbicide**

**Quality Control Summary**
**Spike Recovery Report**

**SDG Number:** **2015-207**
**Client ID:** **CAPA-14-87204MS**
**Lab Sample ID** **1203203433**
**Instrument:** **ECD6A.I**
**Analyst:** **LXA1**
**Inj. Vol:** **1 uL**

**Sample Type:** **Matrix Spike**
**Matrix:** **W**
**Analysis Date:** **11/06/2014 21:18**
**Prep Batch ID:** **1433729**
**Batch ID:** **1433733**
**Dilution: 1**

| CAS No | | Parmname | Amount Added ug/L | Sample Conc. ug/L | | Spike Conc. ug/L | Recovery % | Acceptance Limits |
|---|---|---|---|---|---|---|---|---|
| 87-86-5 | MS | Pentachlorophenol | 2.13 | 0.00 | U | 1.95 | 91 | 24-119 |

# Method Blank Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Client:** | **ARSL004** | **Matrix:** | **WATER** |
| **Client ID:** | **MB for batch 1433729** | **Instrument ID:** | **ECD6A.I_1**<br>**ECD6A.I_2** | **Data File:** | **110614\E6k0614.D**<br>**110614\E6k0614.D** |
| **Lab Sample ID:** | **1203203431** | | | | |
| **Column:** | **CLP**<br>**CLP2** | **Prep Date:** | **11/06/2014 04:50** | **Analyzed:** | **11/06/14 18:04** |

**This method blank applies to the following samples and quality control samples:**

| Client Sample ID | Lab Sample ID | File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|
| 01 LCS for batch 1433729 | 1203203432 | 110614\E6k0615.D<br>110614\E6k0615.D | 11/06/14 | 1832 |
| 02 LCSD for batch 1433729 | 1203203437 | 110614\E6k0616.D<br>110614\E6k0616.D | 11/06/14 | 1859 |
| 03 CAWR-14-89229 | 360425006 | 110614\E6k0618.D<br>110614\E6k0618.D | 11/06/14 | 1955 |
| 04 CAWR-14-89222 | 360425012 | 110614\E6k0619.D<br>110614\E6k0619.D | 11/06/14 | 2023 |
| 05 CAPA-14-87204MS | 1203203433 | 110614\E6k0621.D<br>110614\E6k0621.D | 11/06/14 | 2118 |

# Quality Control Data

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203431** | | | | |
| **Client Sample:** | **QC for batch 1433729** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **MB for batch 1433729** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1433733** | **Inst:** | **ECD6A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 18:04** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 04:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **110614\E6k0614.D** | **Column:** | **1 CLP** | | |
| | **110614\E6k0614.D** | | **2 CLP2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | U | 0.250 | ug/L | 0.0833 | 0.250 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.17 | 5.00 | ug/L | 103 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203432** | | | | |
| **Client Sample:** | **QC for batch 1433729** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCS for batch 1433729** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1433733** | **Inst:** | **ECD6A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 18:32** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 04:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **110614\E6k0615.D** | **Column:** | **1 CLP** | | |
| | **110614\E6k0615.D** | | **2 CLP2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.83 | ug/L | 0.0833 | 0.250 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 5.83 | 5.00 | ug/L | 117 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | **Date Collected:** | **10/30/2014 11:04** | **Matrix:** | **W** |
| **Lab Sample ID:** | **1203203433** | **Date Received:** | **11/04/2014 09:10** | | |
| **Client Sample:** | **QC for batch 1433729** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **CAPA-14-87204MS** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1433733** | **Inst:** | **ECD6A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 21:18** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 04:50** | **Aliquot:** | **940 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **110614\E6k0621.D** | **Column:** | **1 CLP** | | |
| | **110614\E6k0621.D** | | **2 CLP2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.95 | ug/L | 0.0886 | 0.266 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 7.33 | 5.32 | ug/L | 138 | (40%-138%) |

# Herbicide
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2015-207** | | | **Matrix:** | **WATER** |
| **Lab Sample ID:** | **1203203437** | | | | |
| **Client Sample:** | **QC for batch 1433729** | **Client:** | **ARSL004** | **Project:** | **QC** |
| **Client ID:** | **LCSD for batch 1433729** | **Method:** | **SW846 8151A** | **SOP Ref:** | **GL-OA-E-011** |
| **Batch ID:** | **1433733** | **Inst:** | **ECD6A.I** | **Dilution:** | **1** |
| **Run Date:** | **11/06/2014 18:59** | **Analyst:** | **LXA1** | **Inj. Vol:** | **1 uL** |
| **Prep Date:** | **11/06/2014 04:50** | **Aliquot:** | **1000 mL** | **Final Volume:** | **10 mL** |
| **Data File:** | **110614\E6k0616.D** | **Column:** | **1 CLP** | | |
| | **110614\E6k0616.D** | | **2 CLP2** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ | Column |
|---|---|---|---|---|---|---|---|
| 87-86-5 | Pentachlorophenol | | 1.89 | ug/L | 0.0833 | 0.250 | 1 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 6.02 | 5.00 | ug/L | 120 | (40%-138%) |

# Metals Analysis

# Case Narrative

**Metals Fractional Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

| **Sample ID** | **Client ID** |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203202614 | Method Blank (MB)**ICP** |
| 1203202615 | Laboratory Control Sample (LCS) |
| 1203202618 | 360431007(CAPA-14-87230L) Serial Dilution (SD) |
| 1203202616 | 360431007(CAPA-14-87230D) Sample Duplicate (DUP) |
| 1203202617 | 360431007(CAPA-14-87230S) Matrix Spike (MS) |
| 1203202552 | Method Blank (MB)**ICP-MS** |
| 1203202553 | Laboratory Control Sample (LCS) |
| 1203202556 | 360431007(CAPA-14-87230L) Serial Dilution (SD) |
| 1203202554 | 360431007(CAPA-14-87230D) Sample Duplicate (DUP) |
| 1203202555 | 360431007(CAPA-14-87230S) Matrix Spike (MS) |
| 1203208387 | Method Blank (MB)**CVAA** |
| 1203208388 | Laboratory Control Sample (LCS) |
| 1203208391 | 360759001(WST05-15-90481L) Serial Dilution (SD) |
| 1203208389 | 360759001(WST05-15-90481D) Sample Duplicate (DUP) |
| 1203208390 | 360759001(WST05-15-90481S) Matrix Spike (MS) |

**Sample Analysis**

**Method/Analysis Information**

| | |
|---|---|
| **Analytical Batch:** | 1433383, 1433355, 1435631 and 1438303 |
| **Prep Batch :** | 1433382, 1433354 and 1435624 |
| **Standard Operating Procedures:** | GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 11, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 28 and GL-GC-E-107 REV# 9 |
| **Analytical Method:** | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B |
| **Prep Method :** | SW846 3005A and EPA 245.1/245.2 Prep |

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

**System Configuration**

The Hardness as CaCO3 is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 300X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1600W power, 16 L/m for the plasma, and 1.2 L/m auxiliary gases, and 1.12 L/min carrier gas flow.

## Calibration Information

**Instrument Calibration**
All initial calibration requirements have been met for this sample delivery group (SDG).

**CRDL/PQL Requirements**
The CRDL/PQL standard recoveries met the referenced advisory control limits.

**ICSA/ICSAB Statement**
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

**Continuing Calibration Blanks (CCB) Requirements**
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

**Continuing Calibration Verification (CCV) Requirements**
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MBs analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Sample Statement**
The following samples were selected as the quality control (QC) samples for this SDG: 360431007 (CAPA-14-87230)-ICP and ICP-MS and 360759001 (WST05-15-90481)-CVAA.

**Matrix Spike (MS) Recovery Statement**
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

**Serial Dilution % Difference Statement**
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

**Technical Information**

**Holding Time Specifications**
GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

**Preparation/Analytical Method Verification**
All procedures were performed as stated in the SOP.

**Sample Dilutions**
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Per the SOP, sample was diluted for chromium and nickel due to internal standard recoveries outside the acceptable control limits. 360425013 (CAWR-14-89223)-ICP-MS.

**Preparation Information**
The samples in this SDG were prepared exactly according to the cited SOP.

**Miscellaneous Information**

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

**Additional Comments**
Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:** Nick-Cole A. Elmore **Date:** 12.1.14

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207  GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by Nick-Cole A. Elmore 12.1.14

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−207 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 360425003 **BASIS:** As Received **DATE COLLECTED** 30−OCT−14

**CLIENT ID:** CAWR−14−89229 **LEVEL:** Low **DATE RECEIVED** 04−NOV−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 11/13/14 11:12 | 111314W1−3 | 1435631 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1435631 | 1435624 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/12/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−207 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 360425009 **BASIS:** As Received **DATE COLLECTED** 30−OCT−14

**CLIENT ID:** CAWR−14−89222 **LEVEL:** Low **DATE RECEIVED** 04−NOV−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 11/13/14 11:17 | 111314W1−3 | 1435631 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1435631 | 1435624 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/12/14 | AXS5 |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−207 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 360425013 **BASIS:** As Received **DATE COLLECTED** 30−OCT−14

**CLIENT ID:** CAWR−14−89223 **LEVEL:** Low **DATE RECEIVED** 04−NOV−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 11/13/14 11:19 | 111314W1−3 | 1435631 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2015−207 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 360425013 **BASIS:** As Received **DATE COLLECTED** 30−OCT−14

**CLIENT ID:** CAWR−14−89223 **LEVEL:** Low **DATE RECEIVED** 04−NOV−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7440−38−2 | Arsenic | 4.73 | ug/L | J | 1.7 | 5 | 5 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7440−39−3 | Barium | 118 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−42−8 | Boron | 30.3 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7440−70−2 | Calcium | 46500 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−47−3 | Chromium | 50 | ug/L | U | 10 | 50 | 50 | 5 | MS | PRB | 11/23/14 16:56 | 141123−2 | 1433355 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7439−89−6 | Iron | 445 | ug/L | | 30 | 100 | 100 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7439−95−4 | Magnesium | 2520 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7439−96−5 | Manganese | 706 | ug/L | | 2 | 10 | 10 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7439−98−7 | Molybdenum | 0.894 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7440−02−0 | Nickel | 10 | ug/L | U | 2.5 | 10 | 10 | 5 | MS | PRB | 11/23/14 16:56 | 141123−2 | 1433355 |
| 7440−09−7 | Potassium | 2460 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7631−86−9 | Silica | 55000 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7440−23−5 | Sodium | 24600 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−24−6 | Strontium | 531 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7440−31−5 | Tin | 10 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−61−1 | Uranium | 0.263 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | PRB | 11/23/14 16:16 | 141123−2 | 1433355 |
| 7440−62−2 | Vanadium | 1.48 | ug/L | J | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |
| 7440−66−6 | Zinc | 3.97 | ug/L | J | 3.3 | 10 | 10 | 1 | P | HSC | 11/10/14 17:33 | 111014−1 | 1433383 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−207 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 360425013 **BASIS:** As Received **DATE COLLECTED** 30−OCT−14

**CLIENT ID:** CAWR−14−89223 **LEVEL:** Low **DATE RECEIVED** 04−NOV−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 126 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/21/14 09:16 | | 1438303 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1433355 | 1433354 | SW846 3005A | 50 | mL | 50 | mL | 11/05/14 | KXP3 |
| 1433383 | 1433382 | SW846 3005A | 50 | mL | 50 | mL | 11/05/14 | KXP3 |
| 1435631 | 1435624 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/12/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−207 **CONTRACT:** ESHL00714 **METHOD TYPE:** EPA

**SAMPLE ID:** 360425016 **BASIS:** As Received **DATE COLLECTED** 30−OCT−14

**CLIENT ID:** CAWR−14−89236 **LEVEL:** Low **DATE RECEIVED** 04−NOV−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439−97−6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | MTM1 | 11/13/14 11:21 | 111314W1−3 | 1435631 |

# METALS
## −1−
## INORGANICS ANALYSIS DATA PACKAGE

**SDG No:** 2015−207 **CONTRACT:** ESHL00714 **METHOD TYPE:** SW846

**SAMPLE ID:** 360425016 **BASIS:** As Received **DATE COLLECTED** 30−OCT−14

**CLIENT ID:** CAWR−14−89236 **LEVEL:** Low **DATE RECEIVED** 04−NOV−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7429−90−5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−36−0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−38−2 | Arsenic | 4.85 | ug/L | J | 1.7 | 5 | 5 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−39−3 | Barium | 115 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−41−7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−42−8 | Boron | 30.1 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−43−9 | Cadmium | 1 | ug/L | U | 0.11 | 1 | 1 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−70−2 | Calcium | 45000 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−47−3 | Chromium | 10 | ug/L | U | 2 | 10 | 10 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−48−4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−50−8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7439−89−6 | Iron | 429 | ug/L | | 30 | 100 | 100 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7439−92−1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7439−95−4 | Magnesium | 2460 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7439−96−5 | Manganese | 679 | ug/L | | 2 | 10 | 10 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7439−98−7 | Molybdenum | 0.802 | ug/L | | 0.165 | 0.5 | 0.5 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−02−0 | Nickel | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−09−7 | Potassium | 2450 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7782−49−2 | Selenium | 5 | ug/L | U | 1.5 | 5 | 5 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7631−86−9 | Silica | 53500 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−22−4 | Silver | 1 | ug/L | U | 0.2 | 1 | 1 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−23−5 | Sodium | 24200 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−24−6 | Strontium | 514 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−28−0 | Thallium | 2 | ug/L | U | 0.45 | 2 | 2 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−31−5 | Tin | 10 | ug/L | U | 2.5 | 10 | 10 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−61−1 | Uranium | 0.250 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | PRB | 11/23/14 16:52 | 141123−2 | 1433355 |
| 7440−62−2 | Vanadium | 1.43 | ug/L | J | 1 | 5 | 5 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |
| 7440−66−6 | Zinc | 10 | ug/L | U | 3.3 | 10 | 10 | 1 | P | HSC | 11/10/14 17:35 | 111014−1 | 1433383 |

**METALS**
**−1−**
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2015−207 **CONTRACT:** ESHL00714 **METHOD TYPE:**

**SAMPLE ID:** 360425016 **BASIS:** As Received **DATE COLLECTED** 30−OCT−14

**CLIENT ID:** CAWR−14−89236 **LEVEL:** Low **DATE RECEIVED** 04−NOV−14

**MATRIX:** W **%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hardness as CaCO3 | 123 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 11/21/14 09:16 | | 1438303 |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|---|---|---|---|---|---|---|---|---|
| 1433355 | 1433354 | SW846 3005A | 50 | mL | 50 | mL | 11/05/14 | KXP3 |
| 1433383 | 1433382 | SW846 3005A | 50 | mL | 50 | mL | 11/05/14 | KXP3 |
| 1435631 | 1435624 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 11/12/14 | AXS5 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

# Quality Control Summary

**METALS**
**−3b−**
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2015−207

**Contract:** ESHL00714

**Matrix:** W

| Sample ID | Analyte | Result | Units | Acceptance Window | Conc Qual | M* | MDL | RDL |
|---|---|---|---|---|---|---|---|---|
| 1203202552 | | | | | | | | |
| | Arsenic | 1.7 | ug/L | +/−5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.11 | ug/L | +/−1 | U | MS | 0.11 | 1 |
| | Chromium | 2 | ug/L | +/−10 | U | MS | 2 | 10 |
| | Lead | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.165 | ug/L | +/−0.5 | U | MS | 0.165 | 0.5 |
| | Nickel | 0.5 | ug/L | +/−2 | U | MS | 0.5 | 2 |
| | Selenium | 1.5 | ug/L | +/−5 | U | MS | 1.5 | 5 |
| | Antimony | 1 | ug/L | +/−3 | U | MS | 1 | 3 |
| | Silver | 0.2 | ug/L | +/−1 | U | MS | 0.2 | 1 |
| | Thallium | 0.45 | ug/L | +/−2 | U | MS | 0.45 | 2 |
| | Uranium | 0.067 | ug/L | +/−0.2 | U | MS | 0.067 | 0.2 |
| 1203202614 | | | | | | | | |
| | Aluminum | 68 | ug/L | +/−200 | U | P | 68 | 200 |
| | Calcium | 50 | ug/L | +/−200 | U | P | 50 | 200 |
| | Copper | 3 | ug/L | +/−10 | U | P | 3 | 10 |
| | Magnesium | 110 | ug/L | +/−300 | U | P | 110 | 300 |
| | Potassium | 50 | ug/L | +/−150 | U | P | 50 | 150 |
| | Sodium | 100 | ug/L | +/−300 | U | P | 100 | 300 |
| | Zinc | 3.3 | ug/L | +/−10 | U | P | 3.3 | 10 |
| | Vanadium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/−10 | U | P | 2.5 | 10 |
| | Strontium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Silica | 53 | ug/L | +/−213 | U | P | 53 | 213 |
| | Manganese | 2 | ug/L | +/−10 | U | P | 2 | 10 |
| | Iron | 30 | ug/L | +/−100 | U | P | 30 | 100 |
| | Cobalt | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/−50 | U | P | 15 | 50 |
| | Barium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| | Beryllium | 1 | ug/L | +/−5 | U | P | 1 | 5 |
| 1203208387 | | | | | | | | |
| | Mercury | 0.067 | ug/L | +/−0.2 | U | AV | 0.067 | 0.2 |

***Analytical Methods:**

| | |
|---|---|
| **P** | **SW846 3005A/6010C** |
| **MS** | **SW846 3005A/6020A** |
| **AV** | **EPA 245.1/245.2** |

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−207 **Client ID** CAPA−14−87230S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 360431007 **Spike ID:** 1203202555

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | 75−125 | 51.1 | | 1 | U | 50 | 102 | | MS |
| Arsenic | ug/L | 75−125 | 54 | | 1.82 | J | 50 | 104 | | MS |
| Cadmium | ug/L | 75−125 | 51.5 | | 0.11 | U | 50 | 103 | | MS |
| Chromium | ug/L | 75−125 | 57.6 | | 2.34 | J | 50 | 111 | | MS |
| Lead | ug/L | 75−125 | 51.5 | | 0.5 | U | 50 | 103 | | MS |
| Molybdenum | ug/L | 75−125 | 53.1 | | 1.84 | | 50 | 102 | | MS |
| Nickel | ug/L | 75−125 | 54.8 | | 0.5 | U | 50 | 109 | | MS |
| Selenium | ug/L | 75−125 | 52.7 | | 1.5 | U | 50 | 105 | | MS |
| Silver | ug/L | 75−125 | 52.5 | | 0.2 | U | 50 | 105 | | MS |
| Thallium | ug/L | 75−125 | 49.7 | | 0.45 | U | 50 | 99.4 | | MS |
| Uranium | ug/L | 75−125 | 54.6 | | 0.609 | | 50 | 108 | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−207 **Client ID** CAPA−14−87230S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 360431007 **Spike ID:** 1203202617

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | 75−125 | 4940 | | 68 | U | 5000 | 98.9 | | P |
| Barium | ug/L | 75−125 | 526 | | 31.1 | | 500 | 99 | | P |
| Beryllium | ug/L | 75−125 | 497 | | 1 | U | 500 | 99.5 | | P |
| Boron | ug/L | 75−125 | 501 | | 15 | U | 500 | 97.8 | | P |
| Calcium | ug/L | 75−125 | 17500 | | 12500 | | 5000 | 99.7 | | P |
| Cobalt | ug/L | 75−125 | 501 | | 1 | U | 500 | 100 | | P |
| Copper | ug/L | 75−125 | 505 | | 3 | U | 500 | 101 | | P |
| Iron | ug/L | 75−125 | 4910 | | 30 | U | 5000 | 98.1 | | P |
| Magnesium | ug/L | 75−125 | 8570 | | 3880 | | 5000 | 93.8 | | P |
| Manganese | ug/L | 75−125 | 489 | | 2 | U | 500 | 97.6 | | P |
| Potassium | ug/L | 75−125 | 6150 | | 1540 | | 5000 | 92.1 | | P |
| Silica | ug/L | | 77100 | | 66700 | | 10700 | 97.1 | N/A | P |
| Sodium | ug/L | 75−125 | 14800 | | 10200 | | 5000 | 92.4 | | P |
| Strontium | ug/L | 75−125 | 549 | | 57.4 | | 500 | 98.4 | | P |
| Tin | ug/L | 75−125 | 498 | | 2.5 | U | 500 | 99.6 | | P |
| Vanadium | ug/L | 75−125 | 519 | | 3.9 | J | 500 | 103 | | P |
| Zinc | ug/L | 75−125 | 486 | | 5.74 | J | 500 | 96 | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−5a−**

**Matrix Spike Summary**

**SDG NO.** 2015−207 **Client ID** WST05−15−90481S

**Contract:** ESHL00714 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 360759001 **Spike ID:** 1203208390

| Analyte | Units | Acceptance Limit | Spiked Result | C | Sample Result | C | Spike Added | % Recovery | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | 75−125 | 1.89 | | 0.067 | U | 2 | 94.3 | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−207 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CAPA−14−87230D

**Matrix:** WATER **Level:** Low

**Sample ID:** 360431007 **Duplicate ID:** 1203202554 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ug/L | | 1 | U | 1 | U | | | MS |
| Arsenic | ug/L | | 1.82 | J | 1.7 | U | 200 | | MS |
| Cadmium | ug/L | | 0.11 | U | 0.11 | U | | | MS |
| Chromium | ug/L | +/−10 | 2.34 | J | 2.28 | J | 2.81 | | MS |
| Lead | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Molybdenum | ug/L | +/−.5 | 1.84 | | 1.72 | | 7.02 | | MS |
| Nickel | ug/L | | 0.5 | U | 0.5 | U | | | MS |
| Selenium | ug/L | | 1.5 | U | 1.5 | U | | | MS |
| Silver | ug/L | | 0.2 | U | 0.2 | U | | | MS |
| Thallium | ug/L | | 0.45 | U | 0.45 | U | | | MS |
| Uranium | ug/L | +/−.2 | 0.609 | | 0.74 | | 19.4 | | MS |

***Analytical Methods:**

**MS SW846 3005A/6020A**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−207 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** CAPA−14−87230D

**Matrix:** WATER **Level:** Low

**Sample ID:** 360431007 **Duplicate ID:** 1203202616 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | ug/L | | 68 | U | 68 | U | | | P |
| Barium | ug/L | +/−20% | 31.1 | | 30.4 | | 2.31 | | P |
| Beryllium | ug/L | | 1 | U | 1 | U | | | P |
| Boron | ug/L | | 15 | U | 15 | U | | | P |
| Calcium | ug/L | +/−20% | 12500 | | 12200 | | 2.07 | | P |
| Cobalt | ug/L | | 1 | U | 1 | U | | | P |
| Copper | ug/L | | 3 | U | 3 | U | | | P |
| Iron | ug/L | | 30 | U | 30 | U | | | P |
| Magnesium | ug/L | +/−20% | 3880 | | 3820 | | 1.77 | | P |
| Manganese | ug/L | | 2 | U | 2 | U | | | P |
| Potassium | ug/L | +/−20% | 1540 | | 1510 | | 1.82 | | P |
| Silica | ug/L | +/−20% | 66700 | | 65200 | | 2.36 | | P |
| Sodium | ug/L | +/−20% | 10200 | | 9930 | | 2.76 | | P |
| Strontium | ug/L | +/−20% | 57.4 | | 55.6 | | 3.17 | | P |
| Tin | ug/L | | 2.5 | U | 2.5 | U | | | P |
| Vanadium | ug/L | +/−5 | 3.9 | J | 3.74 | J | 4.29 | | P |
| Zinc | ug/L | +/−10 | 5.74 | J | 5.28 | J | 8.33 | | P |

***Analytical Methods:**

**P SW846 3005A/6010C**

**Metals**
**−6−**
**Duplicate Sample Summary**

**SDG No.:** 2015−207 **Lab Code:** GEL

**Contract:** ESHL00714 **Client ID:** WST05−15−90481D

**Matrix:** WATER **Level:** Low

**Sample ID:** 360759001 **Duplicate ID:** 1203208389 **Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

***Analytical Methods:**

**AV EPA 245.1/245.2**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−207

**Contract:** ESHL00714

**Aqueous LCS Source:** O2Si **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203202553 | | | | | | | | |
| | Antimony | ug/L | 50 | 51.6 | | 103 | 80−120 | MS |
| | Arsenic | ug/L | 50 | 55.7 | | 111 | 80−120 | MS |
| | Cadmium | ug/L | 50 | 52.8 | | 106 | 80−120 | MS |
| | Chromium | ug/L | 50 | 53.9 | | 108 | 80−120 | MS |
| | Lead | ug/L | 50 | 52 | | 104 | 80−120 | MS |
| | Molybdenum | ug/L | 50 | 52.1 | | 104 | 80−120 | MS |
| | Nickel | ug/L | 50 | 54.1 | | 108 | 80−120 | MS |
| | Selenium | ug/L | 50 | 55.1 | | 110 | 80−120 | MS |
| | Silver | ug/L | 50 | 53.9 | | 108 | 80−120 | MS |
| | Thallium | ug/L | 50 | 51.5 | | 103 | 80−120 | MS |
| | Uranium | ug/L | 50 | 51.8 | | 104 | 80−120 | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−207

**Contract:** ESHL00714

**Aqueous LCS Source:** OS2I **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203202615 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 5070 | | 101 | 80−120 | P |
| | Barium | ug/L | 500 | 491 | | 98.2 | 80−120 | P |
| | Beryllium | ug/L | 500 | 486 | | 97.2 | 80−120 | P |
| | Boron | ug/L | 500 | 475 | | 94.9 | 80−120 | P |
| | Calcium | ug/L | 5000 | 4850 | | 96.9 | 80−120 | P |
| | Cobalt | ug/L | 500 | 496 | | 99.3 | 80−120 | P |
| | Copper | ug/L | 500 | 492 | | 98.4 | 80−120 | P |
| | Iron | ug/L | 5000 | 4860 | | 97.2 | 80−120 | P |
| | Magnesium | ug/L | 5000 | 4750 | | 95.1 | 80−120 | P |
| | Manganese | ug/L | 500 | 490 | | 98 | 80−120 | P |
| | Potassium | ug/L | 5000 | 4630 | | 92.6 | 80−120 | P |
| | Silica | ug/L | 10700 | 10300 | | 95.9 | 80−120 | P |
| | Sodium | ug/L | 5000 | 4880 | | 97.7 | 80−120 | P |
| | Strontium | ug/L | 500 | 496 | | 99.3 | 80−120 | P |
| | Tin | ug/L | 500 | 496 | | 99.3 | 80−120 | P |
| | Vanadium | ug/L | 500 | 510 | | 102 | 80−120 | P |
| | Zinc | ug/L | 500 | 478 | | 95.6 | 80−120 | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−7−**
**Laboratory Control Sample Summary**

**SDG NO.** 2015−207

**Contract:** ESHL00714

**Aqueous LCS Source:** GEL **Solid LCS Source:**

| Sample ID | Analyte | Units | True Value | Result | C | % Recovery | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| 1203208388 | | | | | | | | |
| | Mercury | ug/L | 2 | 2.02 | | 101 | 85−115 | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−207 **Client ID** CAPA−14−87230L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 360431007 **Serial Dilution ID:** 1203202556

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 1.82 | J | 8.5 | U | 100 | | | MS |
| Cadmium | .11 | U | .55 | U | | | | MS |
| Chromium | 2.34 | J | 10 | U | 100 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | 1.84 | | 2.23 | J | 20.8 | | | MS |
| Nickel | .5 | U | 2.5 | U | | | | MS |
| Selenium | 1.5 | U | 7.5 | U | | | | MS |
| Silver | .2 | U | 1 | U | | | | MS |
| Thallium | .45 | U | 2.25 | U | | | | MS |
| Uranium | .609 | | .685 | J | 12.5 | | | MS |

***Analytical Methods:**

**MS** **SW846 3005A/6020A**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−207 **Client ID** CAPA−14−87230L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 360431007 **Serial Dilution ID:** 1203202618

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 31.1 | | 31.4 | | .908 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 15 | U | 75 | U | | | | P |
| Calcium | 12500 | | 12300 | | 1.22 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 15 | U | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 3880 | | 3910 | | .623 | | | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 1540 | | 1520 | | 1.45 | | | P |
| Silica | 66700 | | 64800 | | 2.87 | | 10 | P |
| Sodium | 10200 | | 10300 | | .436 | | 10 | P |
| Strontium | 57.4 | | 59.5 | | 3.58 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 3.9 | J | 5 | U | 100 | | | P |
| Zinc | 5.74 | J | 16.5 | U | 100 | | | P |

***Analytical Methods:**

**P** **SW846 3005A/6010C**

**METALS**
**−9−**
**Serial Dilution Sample Summary**

**SDG NO.** 2015−207 **Client ID** WST05−15−90481L

**Contract:** ESHL00714

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 360759001 **Serial Dilution ID:** 1203208391

| Analyte | Initial Value ug/L | C | Serial Value ug/L | C | % Difference | Qual | Acceptance Limit | M* |
|---|---|---|---|---|---|---|---|---|
| Mercury | .067 | U | .335 | U | | | | AV |

***Analytical Methods:**

**AV** **EPA 245.1/245.2**

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**

## Method/Analysis Information

**Product:** **Carbon and Total Organic**

**Analytical Batch:** 1435687 **Method:** SW 9060 Total Organic Carbon

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203208550 | Method Blank (MB) |
| 1203208551 | Laboratory Control Sample (LCS) |
| 1203208552 | 359946012(CAPA-14-87201) Sample Duplicate (DUP) |
| 1203208553 | 360755004(CAMO-15-90216) Sample Duplicate (DUP) |
| 1203208554 | 359946012(CAPA-14-87201) Post Spike (PS) |
| 1203208555 | 360755004(CAMO-15-90216) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 359946012 (CAPA-14-87201) and 360755004 (CAMO-15-90216).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Cyanide and Total** | | |
| **Analytical Batch:** | 1432348 | **Method:** | WSP-CN(T) |
| **Prep Batch :** | 1432347 | **Method:** | EPA 335.4 |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203200097 | Method Blank (MB) |
| 1203200098 | Laboratory Control Sample (LCS) |
| 1203200100 | 360117010(CAPA-14-87192) Sample Duplicate (DUP) |
| 1203200103 | 360117010(CAPA-14-87192) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360117010 (CAPA-14-87192).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203200103 (CAPA-14-87192MS).

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203200100 (CAPA-14-87192DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The following sample was re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203200098 (LCS).

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1352362. 1203200103 (CAPA-14-87192MS).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ion Chromatography** | | |
| **Analytical Batch:** | 1436786 | **Method:** | EPA 300.0 Anions Liquid 28 day |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203211471 | Method Blank (MB) |
| 1203211472 | Laboratory Control Sample (LCS) |
| 1203211473 | 360084003(CAPA-14-89329) Sample Duplicate (DUP) |
| 1203211474 | 361141005(CASA-15-90258) Sample Duplicate (DUP) |
| 1203211475 | 360084003(CAPA-14-89329) Post Spike (PS) |
| 1203211476 | 361141005(CASA-15-90258) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 360084003 (CAPA-14-89329) and 361141005 (CASA-15-90258).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203211476 (CASA-15-90258PS). The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203211476 (CASA-15-90258PS).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integrations**
The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203211473 (CAPA-14-89329DUP), 1203211474 (CASA-15-90258DUP), 1203211475 (CAPA-14-89329PS), 1203211476 (CASA-15-90258PS), 360425013 (CAWR-14-89223) and 360425016 (CAWR-14-89236).

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Ammonia Nitrogen** | | |
| **Analytical Batch:** | 1433995 | **Method:** | EPA 350.1 Nitrogen and Ammonia L |
| **Prep Batch :** | 1433994 | **Method:** | EEPA 350.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203204147 | Method Blank (MB) |
| 1203204148 | Laboratory Control Sample (LCS) |
| 1203204150 | 360425013(CAWR-14-89223) Sample Duplicate (DUP) |
| 1203204152 | 360425013(CAWR-14-89223) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB 1203204147 (MB) analyzed with this SDG met the acceptance criteria. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360425013 (CAWR-14-89223).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recoveries for this sample set were within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
One or more of the values for the sample and/or duplicate are less than 5 times the Practical Quantitation Limit (PQL), and the difference is within one PQL value; therefore, the RPD is not applicable. 1203204150 (CAWR-14-89223DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Kjeldahl Nitrogen** | | |
| **Analytical Batch:** | 1431334 | **Method:** | Nitrogen and Total Kjeldahl (TKN) |
| **Prep Batch :** | 1431333 | **Method:** | EEPA 351.2 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203197571 | Method Blank (MB) |
| 1203197572 | Laboratory Control Sample (LCS) |
| 1203197573 | 359935003(CAPA-14-87195) Sample Duplicate (DUP) |
| 1203197574 | 359935003(CAPA-14-87195) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 359935003 (CAPA-14-87195).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203197574 (CAPA-14-87195MS).

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203197573 (CAPA-14-87195DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1354053. 1203197574 (CAPA-14-87195MS).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Nitrate Nitrite by Cadmium Reduction** | | |
| **Analytical Batch:** | 1434006 | **Method:** | EPA 353.2 Nitrogen and Nitrate/Nitrite |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2:

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203204183 | Method Blank (MB) |
| 1203204184 | Laboratory Control Sample (LCS) |
| 1203204185 | 360425013(CAWR-14-89223) Sample Duplicate (DUP) |
| 1203204186 | 360425013(CAWR-14-89223) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360425013 (CAWR-14-89223).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203204185 (CAWR-14-89223DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Total Phosphorus** | | |
| **Analytical Batch:** | 1433200 | **Method:** | EPA 365.4 Phosphorus and Total in |
| **Prep Batch :** | 1433197 | **Method:** | EEPA 365.4 Prep |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203202126 | Method Blank (MB) |
| 1203202127 | Laboratory Control Sample (LCS) |
| 1203202128 | 360294001(WSTMO-14-87080) Sample Duplicate (DUP) |
| 1203207258 | 360890002(NP048-15-89157) Sample Duplicate (DUP) |
| 1203202129 | 360294001(WSTMO-14-87080) Matrix Spike (MS) |
| 1203207259 | 360890002(NP048-15-89157) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

**Continuing Calibration Blanks**
All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

**Calibration Verification Information (CCV)**
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

**Y Intercept Rule**
The absolute value of the intercept is less than 3 times the MDL.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 360294001 (WSTMO-14-87080) and 360890002 (NP048-15-89157).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The sample concentration is more than four times the spike nominal concentration; therefore, the spike recovery is not applicable. 1203202129 (WSTMO-14-87080MS).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**
All the samples from this sample group met the preservation and integrity requirements of the method.

**Sample Dilutions**
The following samples in this sample group were diluted due to high concentration: 1203202128 (WSTMO-14-87080DUP) and 1203202129 (WSTMO-14-87080MS).

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Solids and Total Dissolved** | | |
| **Analytical Batch:** | 1433342 | **Method:** | EPA 160.1 Solids and Dissolved-F |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203202507 | Method Blank (MB) |
| 1203202508 | Laboratory Control Sample (LCS) |
| 1203202509 | 360424007(CAPA-14-87208) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

**Initial Calibration**
All initial calibration requirements have been met for this SDG.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360424007 (CAPA-14-87208).

**Duplicate Relative Percent Difference (RPD) Statement**
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1203202509 (CAPA-14-87208DUP).

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Sample Aliquot**
A sufficient amount of sample was provided by the client for analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1353330. 1203202509 (CAPA-14-87208DUP).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

| | | | |
|---|---|---|---|
| **Product:** | **Specific Conductivity** | | |
| **Analytical Batch:** | 1436124 | **Method:** | EPA120.1 Specific Conductivity |

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203209652 | Laboratory Control Sample (LCS) |
| 1203209653 | 360754005(CAMO-15-90235) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

**Initial Standardization**
The titrant was properly standardized

**Calibration Verification Information**
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

## Quality Control (QC) Information

**Method Blank (MB) Statement**
This batch does not require a method blank.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following sample was selected for QC analysis: 360754005 (CAMO-15-90235).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **pH**

**Analytical Batch:** 1433708 **Method:** EPA 150.1 pH

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203203393 | Laboratory Control Sample (LCS) |
| 1203203394 | 360288001(WSTMO-14-86604) Sample Duplicate (DUP) |
| 1203203395 | 360285007(CAPA-14-87212) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
This batch does not require a method blank.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**
The following samples were selected for QC analysis: 360285007 (CAPA-14-87212) and 360288001

(WSTMO-14-86604).

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
The following samples from this sample group were received by the lab outside of the method specified holding time: 360425013 (CAWR-14-89223) and 360425016 (CAWR-14-89236).

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
The following DER was generated for this SDG: 1354161. 360425013 (CAWR-14-89223) and 360425016 (CAWR-14-89236).

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

## Method/Analysis Information

**Product:** **Alkalinity**

**Analytical Batch:** 1435239 **Method:** EPA 310.1 Total Alkalinity

## Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

| Sample ID | Client ID |
|---|---|
| 360425013 | CAWR-14-89223 |
| 360425016 | CAWR-14-89236 |
| 1203207405 | Method Blank (MB) |
| 1203207407 | Laboratory Control Sample (LCS) |
| 1203207410 | 360285007(CAPA-14-87212) Sample Duplicate (DUP) |
| 1203207413 | 360285007(CAPA-14-87212) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

**Preparation/Analytical Method Verification**

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

## Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

**Initial Standardization**
The titrant was properly standardized

## Quality Control (QC) Information

**Method Blank (MB) Statement**
The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**
The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

The following sample was selected for QC analysis: 360285007 (CAPA-14-87212).

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**
The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**
The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**
All samples in this SDG met the specified holding time.

**Sample Dilutions**
The samples in this SDG did not require dilutions.

**Sample Re-analysis**
The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**
Additional comments were not required for this SDG.

**Electronic Packaging Comment**
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer:**_____ **Date:**_____01Dec14_____

# Sample Data Summary

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report
## for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207  GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

**  Analyte is a surrogate compound

B  The target analyte was detected in the associated blank.

E  Concentration of the target analyte exceeds the instrument calibration range

H  Analytical holding time was exceeded

J  Value is estimated

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by _____

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: November 28, 2014

| | |
|---|---|
| Company : | Los Alamos National Laboratory |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 |
| | Los Alamos, New Mexico 87545 |
| Contact: | Mr. Keith Greene |
| Project: | LANL-WQH Groundwater Samples |

Client SDG: 2015-207

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-89229 | Project: | ESHL00714 |
| Sample ID: | 360425003 | Client ID: | ARSL004 |
| Matrix: | W | | |
| Collect Date: | 30-OCT-14 13:40 | | |
| Receive Date: | 04-NOV-14 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 2.91 | 0.330 | 1.00 | mg/L | 1 | TSM | 11/17/14 | 2220 | 1435687 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 11/06/14 | 0859 | 1432348 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.172 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 11/11/14 | 1336 | 1431334 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 11/05/14 | 1655 | 1432347 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 11/10/14 | 1700 | 1431333 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: November 28, 2014

| | |
|---|---|
| Company : | Los Alamos National Laboratory |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 |
| | Los Alamos, New Mexico 87545 |
| Contact: | Mr. Keith Greene |
| Project: | LANL-WQH Groundwater Samples |

Client SDG: 2015-207

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-89222 | Project: | ESHL00714 |
| Sample ID: | 360425009 | Client ID: | ARSL004 |
| Matrix: | W | | |
| Collect Date: | 30-OCT-14 13:40 | | |
| Receive Date: | 04-NOV-14 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Analysis | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | |
| Total Organic Carbon Average | | 2.85 | 0.330 | 1.00 | mg/L | 1 | TSM | 11/17/14 | 2253 | 1435687 | 1 |
| Flow Injection Analysis | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1 | AXH3 | 11/06/14 | 0900 | 1432348 | 2 |
| Nutrient Analysis | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl (TKN) "As Received" | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | 0.192 | 0.033 | 0.100 | mg/L | 1 | KLP1 | 11/11/14 | 1337 | 1431334 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 11/05/14 | 1655 | 1432347 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 11/10/14 | 1700 | 1431333 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | SW846 9060 | |
| 2 | EPA 335.4 | |
| 3 | EPA 351.2 | |

**Notes:**

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: November 28, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2015-207

Client Sample ID: CAWR-14-89223
Sample ID: 360425013
Matrix: W
Collect Date: 30-OCT-14 13:40
Receive Date: 04-NOV-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | J | 0.0752 | 0.067 | 0.200 | mg/L | 1 | RXB5 | 11/16/14 | 1336 | 1436786 | 1 |
| Chloride | | 4.02 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.643 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 3.59 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.106 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 11/11/14 | 1627 | 1433995 | 2 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 11/10/14 | 1331 | 1434006 | 3 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 11/11/14 | 1044 | 1433200 | 4 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 247 | 3.40 | 14.3 | mg/L | | MXB3 | 11/05/14 | 1040 | 1433342 | 5 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 20.5C | H | 7.82 | 0.010 | 0.100 | SU | 1 | PXO1 | 11/05/14 | 1517 | 1433708 | 6 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 184 | 0.725 | 1.00 | mg/L | | PXO1 | 11/12/14 | 2124 | 1435239 | 7 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 330 | 3.63 | 14.5 | umhos/cm | 1 | PXO1 | 11/14/14 | 1411 | 1436124 | 8 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | AXH3 | 11/11/14 | 1312 | 1433994 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 11/10/14 | 1700 | 1433197 |

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## Certificate of Analysis

Report Date: November 28, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2015-207 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-89223 | Project: | ESHL00714 |
| Sample ID: | 360425013 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 350.1 | |
| 3 | EPA 353.2 | |
| 4 | EPA 365.4 | |
| 5 | EPA 160.1 | |
| 6 | EPA 150.1 | |
| 7 | EPA 310.1 | |
| 8 | EPA 120.1 | |

**Notes:**

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## Certificate of Analysis

Report Date: November 28, 2014

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client SDG: 2015-207

Client Sample ID: CAWR-14-89236
Sample ID: 360425016
Matrix: W
Collect Date: 30-OCT-14 13:40
Receive Date: 04-NOV-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ion Chromatography | | | | | | | | | | | |
| EPA 300.0 Anions Liquid 28 day "As Received" | | | | | | | | | | | |
| Bromide | J | 0.0768 | 0.067 | 0.200 | mg/L | 1 | RXB5 | 11/16/14 | 1407 | 1436786 | 1 |
| Chloride | | 3.97 | 0.067 | 0.200 | mg/L | 1 | | | | | |
| Fluoride | | 0.611 | 0.033 | 0.100 | mg/L | 1 | | | | | |
| Sulfate | | 3.76 | 0.133 | 0.400 | mg/L | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | |
| EPA 350.1 Nitrogen, Ammonia L "As Received" | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.162 | 0.017 | 0.050 | mg/L | 1 | KLP1 | 11/11/14 | 1633 | 1433995 | 2 |
| EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received" | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 11/10/14 | 1335 | 1434006 | 3 |
| EPA 365.4 Phosphorus, Total in "As Received" | | | | | | | | | | | |
| Phosphorus, Total as P | U | ND | 0.017 | 0.050 | mg/L | 1 | KLP1 | 11/11/14 | 1045 | 1433200 | 4 |
| Solids Analysis | | | | | | | | | | | |
| EPA 160.1 Solids, Dissolved-F "As Received" | | | | | | | | | | | |
| Total Dissolved Solids | | 260 | 3.40 | 14.3 | mg/L | | MXB3 | 11/05/14 | 1040 | 1433342 | 5 |
| Titration and Ion Analysis | | | | | | | | | | | |
| EPA 150.1 pH "As Received" | | | | | | | | | | | |
| pH at Temp 20.7C | H | 7.64 | 0.010 | 0.100 | SU | 1 | PXO1 | 11/05/14 | 1522 | 1433708 | 6 |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 182 | 0.725 | 1.00 | mg/L | | PXO1 | 11/12/14 | 2127 | 1435239 | 7 |
| Carbonate alkalinity (CaCO3) | U | ND | 0.725 | 1.00 | mg/L | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | |
| Conductivity | | 330 | 3.63 | 14.5 | umhos/cm | 1 | PXO1 | 11/14/14 | 1413 | 1436124 | 8 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| EPA 350.2 Prep | EPA 350.1 Ammonia Nitrogen Prep | AXH3 | 11/11/14 | 1312 | 1433994 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 11/10/14 | 1700 | 1433197 |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 28, 2014

| | | | |
|---|---|---|---|
| Company : | Los Alamos National Laboratory | | |
| Address : | TA-03, SM271, Drop Pt. 02U, Rm111 | | |
| | Los Alamos, New Mexico 87545 | | |
| Contact: | Mr. Keith Greene | Client SDG: | 2015-207 |
| Project: | LANL-WQH Groundwater Samples | | |

| | | | |
|---|---|---|---|
| Client Sample ID: | CAWR-14-89236 | Project: | ESHL00714 |
| Sample ID: | 360425016 | Client ID: | ARSL004 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EPA 300.0 | |
| 2 | EPA 350.1 | |
| 3 | EPA 353.2 | |
| 4 | EPA 365.4 | |
| 5 | EPA 160.1 | |
| 6 | EPA 150.1 | |
| 7 | EPA 310.1 | |
| 8 | EPA 120.1 | |

**Notes:**

# Quality Control Summary

# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: November 28, 2014



**Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**
**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **360425**

| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Analysis** | | | | | | | | | | | |
| Batch 1435687 | | | | | | | | | | | |
| QC1203208552 359946012 DUP | | | | | | | | | | | |
| Total Organic Carbon Average | | U | ND | U | ND | mg/L | N/A | | | TSM | 11/17/14 17:38 |
| QC1203208553 360755004 DUP | | | | | | | | | | | |
| Total Organic Carbon Average | | U | ND | U | ND | mg/L | N/A | | | | 11/18/14 03:26 |
| QC1203208551 LCS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 9.47 | mg/L | | 94.7 | (85%-115%) | | 11/17/14 16:23 |
| QC1203208550 MB | | | | | | | | | | | |
| Total Organic Carbon Average | | | | U | ND | mg/L | | | | | 11/17/14 16:14 |
| QC1203208554 359946012 PS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | U | ND | | 10.0 | mg/L | | 97.3 | (65%-120%) | | 11/17/14 17:58 |
| QC1203208555 360755004 PS | | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | U | ND | | 9.99 | mg/L | | 96.9 | (65%-120%) | | 11/18/14 03:46 |
| **Flow Injection Analysis** | | | | | | | | | | | |
| Batch 1432348 | | | | | | | | | | | |
| QC1203200100 360117010 DUP | | | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | | AXH3 | 11/06/14 08:37 |
| QC1203200098 LCS | | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 54.8 | ug/L | | 110 | (90%-110%) | | 11/06/14 08:44 |
| QC1203200097 MB | | | | | | | | | | | |
| Cyanide, Total | | | | U | ND | ug/L | | | | | 11/06/14 08:32 |
| QC1203200103 360117010 MS | | | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 115 | ug/L | | 115* | (90%-110%) | | 11/06/14 08:38 |
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1436786 | | | | | | | | | | | |
| QC1203211473 360084003 DUP | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | RXB5 | 11/16/14 08:57 |
| Chloride | | | 1.46 | | 1.45 | mg/L | 0.378 | | (0%-20%) | | |
| Fluoride | | | 0.181 | | 0.184 | mg/L | 1.32 ^ | | (+/-0.100) | | |
| Sulfate | | | 1.61 | | 1.62 | mg/L | 0.211 ^ | | (+/-0.400) | | |

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## QC Summary

**Workorder:** **360425**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ion Chromatography** | | | | | | | | | | | |
| Batch 1436786 | | | | | | | | | | | |
| QC1203211474 361141005 DUP | | | | | | | | | | | |
| Bromide | | U | ND | U | ND | mg/L | N/A | | | RXB5 | 11/16/14 20:49 |
| Chloride | | | 6.92 | | 6.93 | mg/L | 0.107 | | (0%-20%) | | |
| Fluoride | | | 0.291 | | 0.303 | mg/L | 4.01 ^ | | (+/-0.100) | | |
| Sulfate | | | 5.70 | | 5.72 | mg/L | 0.420 | | (0%-20%) | | |
| QC1203211472 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | | 1.30 | mg/L | | 104 | (90%-110%) | | 11/16/14 06:54 |
| Chloride | 5.00 | | | | 4.90 | mg/L | | 97.9 | (90%-110%) | | |
| Fluoride | 2.50 | | | | 2.52 | mg/L | | 101 | (90%-110%) | | |
| Sulfate | 10.0 | | | | 10.0 | mg/L | | 100 | (90%-110%) | | |
| QC1203211471 MB | | | | | | | | | | | |
| Bromide | | | | U | ND | mg/L | | | | | 11/16/14 06:23 |
| Chloride | | | | U | ND | mg/L | | | | | |
| Fluoride | | | | U | ND | mg/L | | | | | |
| Sulfate | | | | U | ND | mg/L | | | | | |
| QC1203211475 360084003 PS | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.36 | mg/L | | 106 | (90%-110%) | | 11/16/14 09:28 |
| Chloride | 5.00 | | 1.46 | | 6.65 | mg/L | | 104 | (90%-110%) | | |
| Fluoride | 2.50 | | 0.181 | | 2.70 | mg/L | | 101 | (90%-110%) | | |
| Sulfate | 10.0 | | 1.61 | | 12.0 | mg/L | | 103 | (90%-110%) | | |
| QC1203211476 361141005 PS | | | | | | | | | | | |
| Bromide | 1.25 | U | ND | | 1.36 | mg/L | | 104 | (90%-110%) | | 11/16/14 21:20 |
| Chloride | 5.00 | | 6.92 | | 12.8 | mg/L | | 118* | (90%-110%) | | |
| Fluoride | 2.50 | | 0.291 | | 2.81 | mg/L | | 101 | (90%-110%) | | |
| Sulfate | 10.0 | | 5.70 | | 16.4 | mg/L | | 107 | (90%-110%) | | |

**Nutrient Analysis**

## QC Summary

**Workorder:** **360425**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1431334 | | | | | | | | | | | |
| QC1203197573 359935003 DUP | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | | KLP1 | 11/11/14 13:28 |
| QC1203197572 LCS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 1.08 | mg/L | | 108 | (90%-110%) | | 11/11/14 13:23 |
| QC1203197571 MB | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | | U | ND | mg/L | | | | | 11/11/14 13:22 |
| QC1203197574 359935003 MS | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 1.11 | mg/L | | 111* | (90%-110%) | | 11/11/14 13:28 |
| Batch 1433200 | | | | | | | | | | | |
| QC1203202128 360294001 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | | 31.7 | | 31.7 | mg/L | 0.158 | | (0%-20%) | KLP1 | 11/11/14 11:09 |
| QC1203207258 360890002 DUP | | | | | | | | | | | |
| Phosphorus, Total as P | | | 0.127 | | 0.113 | mg/L | 11.7 ^ | | (+/-0.050) | | 11/11/14 11:06 |
| QC1203202127 LCS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 1.09 | mg/L | | 109 | (83%-123%) | | 11/11/14 10:39 |
| QC1203202126 MB | | | | | | | | | | | |
| Phosphorus, Total as P | | | | U | ND | mg/L | | | | | 11/11/14 10:38 |
| QC1203202129 360294001 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | 31.7 | | 28.7 | mg/L | | N/A | (59%-141%) | | 11/11/14 11:10 |
| QC1203207259 360890002 MS | | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | 0.127 | | 1.11 | mg/L | | 98.3 | (59%-141%) | | 11/11/14 11:07 |
| Batch 1433995 | | | | | | | | | | | |
| QC1203204150 360425013 DUP | | | | | | | | | | | |
| Nitrogen, Ammonia | | | 0.106 | | 0.0762 | mg/L | 32.7 ^ | | (+/-0.050) | KLP1 | 11/11/14 16:31 |
| QC1203204148 LCS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 1.08 | mg/L | | 108 | (90%-110%) | | 11/11/14 16:23 |
| QC1203204147 MB | | | | | | | | | | | |
| Nitrogen, Ammonia | | | | J | 0.0209 | mg/L | | | | | 11/11/14 16:22 |
| QC1203204152 360425013 MS | | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | 0.106 | | 1.13 | mg/L | | 102 | (90%-110%) | | 11/11/14 16:32 |
| Batch 1434006 | | | | | | | | | | | |
| QC1203204185 360425013 DUP | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | U | ND | U | ND | mg/L | N/A | | | KLP1 | 11/10/14 13:32 |

## QC Summary

**Workorder:** **360425**



| Parmname | NOM | | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Analysis** | | | | | | | | | | | |
| Batch 1434006 | | | | | | | | | | | |
| QC1203204184 LCS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | | 1.02 | mg/L | | 102 | (90%-110%) | KLP1 | 11/10/14 13:29 |
| QC1203204183 MB | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | | U | ND | mg/L | | | | | 11/10/14 13:27 |
| QC1203204186 360425013 PS | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | U | ND | | 1.00 | mg/L | | 100 | (90%-110%) | | 11/10/14 13:33 |
| **Solids Analysis** | | | | | | | | | | | |
| Batch 1433342 | | | | | | | | | | | |
| QC1203202509 360424007 DUP | | | | | | | | | | | |
| Total Dissolved Solids | | | 176 | | 130 | mg/L | 29.9* | | (0%-10%) | MXB3 | 11/05/14 10:40 |
| QC1203202508 LCS | | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | | 293 | mg/L | | 97.6 | (95%-105%) | | 11/05/14 10:40 |
| QC1203202507 MB | | | | | | | | | | | |
| Total Dissolved Solids | | | | U | ND | mg/L | | | | | 11/05/14 10:40 |
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1433708 | | | | | | | | | | | |
| QC1203203394 360288001 DUP | | | | | | | | | | | |
| pH | | H | 7.70 | H | 7.72 | SU | 0.264 | | (0%-5%) | PXO1 | 11/05/14 14:36 |
| QC1203203395 360285007 DUP | | | | | | | | | | | |
| pH | | H | 8.05 | H | 8.07 | SU | 0.267 | | (0%-5%) | | 11/05/14 14:26 |
| QC1203203393 LCS | | | | | | | | | | | |
| pH | 7.00 | | | | 7.04 | SU | | 101 | (99%-101%) | | 11/05/14 13:52 |
| Batch 1435239 | | | | | | | | | | | |
| QC1203207410 360285007 DUP | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | 79.7 | | 78.7 | mg/L | 1.31 | | (0%-20%) | PXO1 | 11/12/14 17:57 |
| Carbonate alkalinity (CaCO3) | | U | ND | U | ND | mg/L | N/A | | | | |
| QC1203207407 LCS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | | | | 52.3 | mg/L | | 105 | (90%-110%) | | 11/12/14 17:25 |
| QC1203207405 MB | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | | | U | ND | mg/L | | | | | 11/12/14 17:25 |
| Carbonate alkalinity (CaCO3) | | | | U | ND | mg/L | | | | | |

## QC Summary

**Workorder:** **360425**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Titration and Ion Analysis** | | | | | | | | | | | |
| Batch 1435239 | | | | | | | | | | | |
| QC1203207413 360285007 MS | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 50.0 | 79.7 | | 130 | mg/L | | 101 | (80%-120%) | PXO1 | 11/12/14 | 17:59 |
| Batch 1436124 | | | | | | | | | | | |
| QC1203209653 360754005 DUP | | | | | | | | | | | |
| Conductivity | | 167 | | 169 | umhos/cm | 0.860 | | (0%-10%) | PXO1 | 11/14/14 | 14:33 |
| QC1203209652 LCS | | | | | | | | | | | |
| Conductivity | 1410 | | | 1380 | umhos/cm | | 97.6 | (95%-105%) | | 11/14/14 | 14:09 |

**Notes:**

| | |
|---|---|
| < | Result is less than value reported |
| > | Result is greater than value reported |
| B | The target analyte was detected in the associated blank. |
| E | General Chemistry--Concentration of the target analyte exceeds the instrument calibration range |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. |
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes |
| h | Preparation or preservation holding time was exceeded |

## QC Summary

**Workorder:** **360425**



| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 06-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** LACHAT Flow Injection Analyzer | **Test / Method:** EPA 335.4, EPA 335.4 SC, SW846 9012B | **Matrix Type:** Liquid | **Client Code:** ESHL |
| **Batch ID:** 1432348 | **Sample Numbers:** See Below | | |

**Potentially affected work order(s)(SDG):** **360117(2015-172),360121(2015-170),360220(2015-187),360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189),360424(2015-204),360425(2015-207),360431(2015-208)**

**Application Issues:**

Failed Recovery for MS/PS

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br><br>QC 1203200103MS | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference. |

**Originator's Name:**
Aubrey Kingsbury 06-NOV-14

**Data Validator/Group Leader:**
Kristen Parson 06-NOV-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 10-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| BALANCE | EPA 160.1, SM 2540C | Liquid | BATL, BRKL, ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1433342 | See Below | | |

**Potentially affected work order(s)(SDG): 360424(2015-204),360425(2015-207),360431(2015-208)**

**Application Issues:**

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed RPD for DUP:<br><br>QC 1203202509DUP | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Morgan Buckner 10-NOV-14

**Data Validator/Group Leader:**

Elzbieta Szulc 24-NOV-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 11-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| LACHAT Flow Injection Analyzer | EPA 351.2, EPA 351.2 SC | Liquid | AECM, CBMW, CPWC, |
| **Batch ID:** | **Sample Numbers:** | | |
| 1431334 | See Below | | |

**Potentially affected work order(s)(SDG):** **359768(2015-128),359935(2015-149),359943(2015-150),359946(2015-151),360288(2015-191),360425(2015-207),360427,360434,360479,360485,360574(14106579),360590,360592,360593,360594**

**Application Issues:**

Failed Recovery for MS/PS

Failed RPD for DUP

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Failed Recovery for MS/PS:<br>QC 1203197574MS,1203204160MS<br>2. Failed RPD for DUP:<br>QC 1203204159DUP | 1. The spike recovery falls outside of the established acceptance limits due to matrix interference.<br>2. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample. |

**Originator's Name:**

Kristen Parson 11-NOV-14

**Data Validator/Group Leader:**

Aubrey Kingsbury 11-NOV-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 11-NOV-14 | Industrial | Specifications | Process |
| **Instrument Type:** PC-Titrate TitraSip System | **Test / Method:** EPA 150.1, SW846 9040B/9040C, SW846 9040C | **Matrix Type:** Liquid | **Client Code:** ESHL, NEXT, PAES, URSC |
| **Batch ID:** 1433708 | **Sample Numbers:** See Below | | |

**Potentially affected work order(s)(SDG):** **360053(2015-163),360117(2015-172),360121(2015-170),360220(2015-187),360243,360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189),360402,360424(2015-204),360425(2015-207),360431(2015-208),360498**

**Application Issues:**

Sample received out of holding

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Sample received out of holding:<br>360053 007<br>360117 011<br>360121 007<br>360220 007<br>360243 001<br>360285 007<br>360288 001,002<br>360294 001,002<br>360298 001,002<br>360402 001<br>360424 007<br>360425 013,016<br>360431 007,019,028<br>360498 003 | 1. Samples were received and analyzed outside of method specified holding time. |

**Originator's Name:**
Patrick Orgel 11-NOV-14

**Data Validator/Group Leader:**
Elzbieta Szulc 14-NOV-14

# Radiological Analysis

**Radiochemistry Case Narrative**
**ARS International, LLC (ARSL)**
**SDG 2015-207**
**Work Order 360425**

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec U, Liquid** |
| Analytical Method: | DOE EML HASL-300, U-02-RC Modified |
| Analytical Batch Number: | 1433419 |

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203202687 | MB for batch 1433419 |
| 1203202689 | Laboratory Control Sample (LCS) |
| 1203202688 | 360288002(WSTMO-14-86605) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in November 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203202687 (MB) and 1203202689 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360288002 (WSTMO-14-86605). The QC was from ARSL work order 360288.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The U-233/234 blank result is greater than 1.65 times the CSU however all sample activities are greater than or equal to five times the blank activity. The U-238 blank result is greater than 1.65 times the CSU but less than the MDC.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**
Manual integration of alpha spectroscopy spectra 1203202688 (WSTMO-14-86605DUP) was performed to fully separate counts in Regions of Interest which would have been biased.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population. Sample 1203202688 (WSTMO-14-86605DUP) did not meet the client's yield requirement. However, there are 400 tracer counts, GEL's standard tracer yield requirements are met, and the client's detection limits are met.

**Blank Decision Level**
The U-233/234 blank result is greater than the decision level however all sample activities are greater than or equal to five times the blank activity. The U-238 blank result is greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Am241 Liquid** |
| Analytical Method: | DOE EML HASL-300, Am-05-RC Modified |

Analytical Batch Number: 1437369

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203212995 | MB for batch 1437369 |
| 1203212997 | Laboratory Control Sample (LCS) |
| 1203212996 | 360285003(CAPA-14-87186) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibrations were performed in November 2014 and October 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203212995 (MB) and 1203212997 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360285003 (CAPA-14-87186). The QC was from ARSL work order 360285.

**QC Information**
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

**CSU**
The Am-241 blank result is greater than 1.65 times the CSU but less than the MDC.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

Samples were reprepped due to low carrier/tracer yield. The re-analysis is being reported.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1357363 was generated due to RDL less than MDA, Other and Failed Yield for Surrogates. 1. Samples 360285003, 360288002, 360294002, 360298002, 360424003, 360425003, 360425009, 360431003, 360431015, 360431024, and 1203212996 do not meet the requested detection limits for Am-241. 2. Samples 360288002, 360294002, and 360298002 do not meet the client tracer yield requirements of 50 to 105 percent. 3. Samples 360288002 and 360294002 did not achieve 400 Am-241 tracer counts. 1. Samples do not meet due to reduced volume used. Aliquots were reduced on the reanalysis due to high levels of sediment present in the samples and in order to achieve more acceptable tracer yield recoveries. The PM was notified, reporting results. 2. The samples do meet the GEL standard tracer yield requirements of 15 to 125 percent. Low tracer yield recoveries are due to matrix interference caused by high levels of sediment in the samples. The PM was notified, reporting results. 3. The samples do meet the GEL standard tracer yield requirements of 15 to 125 percent. Low tracer yield recoveries are due to matrix interference caused by high levels of sediment in the samples. The PM was notified, reporting results.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The Am-241 blank result is greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Alphaspec Pu, Liquid** |
| Analytical Method: | DOE EML HASL-300, Pu-11-RC Modified |
| Analytical Batch Number: | 1437370 |

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203212998 | MB for batch 1437370 |

| | |
|---|---|
| 1203213000 | Laboratory Control Sample (LCS) |
| 1203212999 | 360285003(CAPA-14-87186) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in November 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203212998 (MB) and 1203213000 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360285003 (CAPA-14-87186). The QC was from ARSL work order 360285.

**QC Information**
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
Samples were reprepped due to low carrier/tracer yield. The re-analysis is being reported.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced

SOP or contractual documents. The following DER was generated for this SDG: DER 1357407 was generated due to RDL less than MDA. 1. Samples 360285003, 360288002, 360294002, 360298002, 360424003, 360425003, 360425009, 360431003, 360431015, 360431024, and 1203212999 did not meet the Pu-238 and Pu-239/240 detection limits due to the reduced aliquots. 1. The sample aliquots were reduced for the re-analysis due to high levels of sediment present and in attempt to achieve acceptable tracer yields. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDCs. Reporting results.

**Manual Integration**
No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **Gammaspec** |
| Analytical Method: | EPA 901.1 |
| Analytical Batch Number: | 1434033 |

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203204247 | MB for batch 1434033 |
| 1203204249 | Laboratory Control Sample (LCS) |
| 1203204248 | 360431003(CAPA-14-87204) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibrations were performed in

August 2014, July 2014, June 2014, October 2014 and September 2014.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
The blank volume is representative of the sample volume in this batch.

**Designated QC**
The following sample was used for QC: 360431003 (CAPA-14-87204). The QC was from ARSL work order 360431.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Recounts**
None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
Additional comments were not required for this sample set.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **WSP-GrossA/B** |
| Analytical Method: | EPA 900.0/SW846 9310 |
| Analytical Batch Number: | 1433352 |

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203202542 | MB for batch 1433352 |
| 1203202546 | Laboratory Control Sample (LCS) |
| 1203202543 | 360431003(CAPA-14-87204) Sample Duplicate (DUP) |
| 1203202544 | 360431003(CAPA-14-87204) Matrix Spike (MS) |
| 1203202545 | 360431003(CAPA-14-87204) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203202542 (MB) and 1203202546 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360431003 (CAPA-14-87204). The QC was from ARSL work order 360431.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Gross Alpha/Beta Preparation Information**
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

**Recounts**
Sample 1203202546 (LCS) was recounted due to high recovery. The recount is reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike and matrix spike duplicate, 1203202544 (CAPA-14-87204MS) and 1203202545 (CAPA-14-87204MSD), aliquots were reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

| | |
|---|---|
| **Product:** | **GFPC, Sr90, liquid** |
| Analytical Method: | EPA 905.0 Modified |
| Analytical Batch Number: | 1434929 |

| Sample ID | Client ID |
|---|---|
| 360425003 | CAWR-14-89229 |
| 360425009 | CAWR-14-89222 |
| 1203206647 | MB for batch 1434929 |
| 1203206650 | Laboratory Control Sample (LCS) |
| 1203206648 | 360053003(CAPA-14-87194) Sample Duplicate (DUP) |
| 1203206649 | 360053003(CAPA-14-87194) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

**Calibration Information:**

**Calibration Information**
All initial and continuing calibration requirements have been met. The initial Calibration was performed in March 2013.

**Standards Information**
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**
All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**
Aliquots for samples 1203206647 (MB) and 1203206650 (LCS) were changed to 1.0 per client request.

**Designated QC**
The following sample was used for QC: 360053003 (CAPA-14-87194). The QC was from ARSL work order 360053.

**QC Information**
All of the QC samples met the required acceptance limits.

**CSU**
The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**
All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**
None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**
All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**
Sample 1203206647 (MB) was recounted due to a suspected blank false positive. The recount is reported. Samples 1203206648 (CAPA-14-87194DUP) and 360425003 (CAWR-14-89229) were recounted due to a suspected false positive. The recounts are reported.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Sample-Specific MDA/MDC**
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**
The matrix spike, 1203206649 (CAPA-14-87194MS), aliquot was reduced to conserve sample volume.

**Blank Decision Level**
The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

# GEL LABORATORIES LLC

2040 Savage Road  Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2015-207  GEL Work Order: 360425

**The Qualifiers in this report are defined as follows:**

*  A quality control analyte recovery is outside of specified acceptance criteria

**  Analyte is a Tracer compound

U  Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer.  In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Heather M. McCarty  **Name:** **Heather McCarty**

**Date:** **28 NOV 2014**  **Title:** **Analyst II**

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 20-NOV-14 | Radiochemistry | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ALPHA SPECTROMETER | DOE EML HASL-300, Am-05-RC Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1437369 | See Below | | |

**Potentially affected work order(s)(SDG):** **360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189),360424(2015-204),360425(2015-207),360431(2015-208)**

**Application Issues:**

RDL less than MDA

Other

Failed Yield for Surrogates

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Samples 360285003, 360288002, 360294002, 360298002, 360424003, 360425003, 360425009, 360431003, 360431015, 360431024, and 1203212996 do not meet the requested detection limits for Am-241. | 1. Samples do not meet due to reduced volume used. Aliquots were reduced on the reanalysis due to high levels of sediment present in the samples and in order to achieve more acceptable tracer yield recoveries. The PM was notified, reporting results. |
| 2. Samples 360288002, 360294002, and 360298002 do not meet the client tracer yield requirements of 50 to 105 percent. | 2. The samples do meet the GEL standard tracer yield requirements of 15 to 125 percent. Low tracer yield recoveries are due to matrix interference caused by high levels of sediment in the samples. The PM was notified, reporting results. |
| 3. Samples 360288002 and 360294002 did not achieve 400 Am-241 tracer counts. | 3. The samples do meet the GEL standard tracer yield requirements of 15 to 125 percent. Low tracer yield recoveries are due to matrix interference caused by high levels of sediment in the samples. The PM was notified, reporting results. |

**Originator's Name:**

Jessica Downey 24-NOV-14

**Data Validator/Group Leader:**

Scott Moreland 24-NOV-14

# DATA EXCEPTION REPORT

| Mo.Day Yr. | Division: | Quality Criteria: | Type: |
|---|---|---|---|
| 20-NOV-14 | Radiochemistry | Specifications | Process |
| **Instrument Type:** | **Test / Method:** | **Matrix Type:** | **Client Code:** |
| ALPHA SPECTROMETER | DOE EML HASL-300, Pu-11-RC Modified | Liquid | ESHL |
| **Batch ID:** | **Sample Numbers:** | | |
| 1437370 | See Below | | |

**Potentially affected work order(s)(SDG):** **360285(2015-188),360288(2015-191),360294(2015-190),360298(2015-189),360424(2015-204),360425(2015-207),360431(2015-208)**

**Application Issues:**

RDL less than MDA

| Specification and Requirements Exception Description: | DER Disposition: |
|---|---|
| 1. Samples 360285003, 360288002, 360294002, 360298002, 360424003, 360425003, 360425009, 360431003, 360431015, 360431024, and 1203212999 did not meet the Pu-238 and Pu-239/240 detection limits due to the reduced aliquots. | 1. The sample aliquots were reduced for the re-analysis due to high levels of sediment present and in attempt to achieve acceptable tracer yields. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDCs. Reporting results. |

**Originator's Name:**
Melanie Aycock 20-NOV-14

**Data Validator/Group Leader:**
Scott Moreland 20-NOV-14

# Sample Data Summary

# GEL LABORATORIES LLC

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# Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: November 28, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-89229
Sample ID: 360425003
Matrix: W
Collect Date: 30-OCT-14
Receive Date: 04-NOV-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | 0.0385 | +/-0.0545 | 0.402 | 0.175 | +/-0.0545 | 0.050 | pCi/L | | JXR1 | 11/19/14 | 1522 | 1437369 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | 0.0643 | +/-0.0454 | 0.215 | 0.0859 | +/-0.0455 | 0.050 | pCi/L | | JXR1 | 11/19/14 | 1522 | 1437370 | 2 |
| Plutonium-239/240 | U | -0.0803 | +/-0.0579 | 0.318 | 0.137 | +/-0.0579 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 0.204 | +/-0.0223 | 0.039 | 0.0169 | +/-0.0257 | 1.00 | pCi/L | | JXR1 | 11/18/14 | 1257 | 1433419 | 3 |
| Uranium-235/236 | U | 0.0118 | +/-0.00781 | 0.034 | 0.0138 | +/-0.00784 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.168 | +/-0.0185 | 0.0374 | 0.0161 | +/-0.0212 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | 0.179 | +/-1.13 | 4.24 | 1.91 | +/-1.13 | 8.00 | pCi/L | | MJH1 | 11/07/14 | 1021 | 1434033 | 4 |
| Cobalt-60 | U | -0.977 | +/-1.20 | 4.31 | 1.84 | +/-1.22 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | 0.886 | +/-2.48 | 8.89 | 4.17 | +/-2.49 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | -3.62 | +/-15.6 | 57.6 | 25.7 | +/-15.6 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | 0.190 | +/-1.18 | 4.60 | 2.00 | +/-1.18 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | 0.464 | +/-0.160 | 0.480 | 0.209 | +/-0.165 | 0.500 | pCi/L | | KSD1 | 11/24/14 | 1241 | 1434929 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | U | 1.37 | +/-0.456 | 1.47 | 0.710 | +/-0.471 | 3.00 | pCi/L | | JXH3 | 11/18/14 | 2101 | 1433352 | 6 |
| Alpha | U | 0.713 | +/-0.474 | 1.58 | 0.729 | +/-0.478 | 3.00 | pCi/L | | JXH3 | 11/19/14 | 2008 | 1433352 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1437369 | 75.5 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1437370 | 85.8 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1433419 | 86.2 | (50%-105%) |

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## Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: November 28, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-89229
Sample ID: 360425003

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1434929 | 91.5 | (50%-105%) |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

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# Certificate of Analysis

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Los Alamos, New Mexico 87545

Report Date: November 28, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-89222
Sample ID: 360425009
Matrix: W
Collect Date: 30-OCT-14
Receive Date: 04-NOV-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec Analysis** | | | | | | | | | | | | | | |
| *Alphaspec Am241 Liquid "As Received"* | | | | | | | | | | | | | | |
| Americium-241 | U | -0.136 | +/-0.101 | 0.474 | 0.206 | +/-0.101 | 0.050 | pCi/L | | JXR1 | 11/19/14 | 1522 | 1437369 | 1 |
| *Alphaspec Pu, Liquid "As Received"* | | | | | | | | | | | | | | |
| Plutonium-238 | U | 5.74E-09 | +/-0.0422 | 0.231 | 0.0921 | +/-0.0422 | 0.050 | pCi/L | | JXR1 | 11/19/14 | 1522 | 1437370 | 2 |
| Plutonium-239/240 | U | -0.0172 | +/-0.0455 | 0.340 | 0.147 | +/-0.0455 | 0.050 | pCi/L | | | | | | |
| *Alphaspec U, Liquid "As Received"* | | | | | | | | | | | | | | |
| Uranium-234 | | 0.238 | +/-0.0227 | 0.0383 | 0.0166 | +/-0.0271 | 1.00 | pCi/L | | JXR1 | 11/18/14 | 1257 | 1433419 | 3 |
| Uranium-235/236 | U | 0.0116 | +/-0.00694 | 0.0334 | 0.0136 | +/-0.00698 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.154 | +/-0.0178 | 0.0367 | 0.0158 | +/-0.0202 | 0.500 | pCi/L | | | | | | |
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec "As Received"* | | | | | | | | | | | | | | |
| Cesium-137 | U | 2.17 | +/-1.52 | 5.72 | 2.67 | +/-1.60 | 8.00 | pCi/L | | MJH1 | 11/07/14 | 1136 | 1434033 | 4 |
| Cobalt-60 | U | -2.76 | +/-1.65 | 5.26 | 2.34 | +/-1.77 | 8.00 | pCi/L | | | | | | |
| Neptunium-237 | U | 2.51 | +/-2.63 | 9.50 | 4.50 | +/-2.70 | 10.0 | pCi/L | | | | | | |
| Potassium-40 | U | -12.8 | +/-19.0 | 70.1 | 32.2 | +/-19.2 | 10.0 | pCi/L | | | | | | |
| Sodium-22 | U | 0.629 | +/-1.43 | 4.90 | 2.17 | +/-1.43 | 10.0 | pCi/L | | | | | | |
| **Rad Gas Flow Proportional Counting** | | | | | | | | | | | | | | |
| *GFPC, Sr90, liquid "As Received"* | | | | | | | | | | | | | | |
| Strontium-90 | U | 0.0938 | +/-0.141 | 0.486 | 0.224 | +/-0.141 | 0.500 | pCi/L | | KSD1 | 11/22/14 | 1306 | 1434929 | 5 |
| *WSP-GrossA/B "As Received"* | | | | | | | | | | | | | | |
| Beta | | 2.14 | +/-0.542 | 1.72 | 0.839 | +/-0.573 | 3.00 | pCi/L | | JXH3 | 11/18/14 | 2105 | 1433352 | 6 |
| Alpha | U | 0.388 | +/-0.412 | 1.41 | 0.646 | +/-0.413 | 3.00 | pCi/L | | JXH3 | 11/19/14 | 2008 | 1433352 | 7 |

**The following Analytical Methods were performed**

| Method | Description |
|---|---|
| 1 | DOE EML HASL-300, Am-05-RC Modified |
| 2 | DOE EML HASL-300, Pu-11-RC Modified |
| 3 | DOE EML HASL-300, U-02-RC Modified |
| 4 | EPA 901.1 |
| 5 | EPA 905.0 Modified |
| 6 | EPA 900.0/SW846 9310 |
| 7 | EPA 900.0/SW846 9310 |

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|
| Americium-243 Tracer | Alphaspec Am241 Liquid "As Received" | 1437369 | 67.5 | (50%-105%) |
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | 1437370 | 82.0 | (50%-105%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | 1433419 | 97.9 | (50%-105%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | 1434929 | 95.4 | (50%-105%) |

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## Certificate of Analysis

Company : Los Alamos National Laboratory
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Los Alamos, New Mexico 87545

Report Date: November 28, 2014

Contact: Mr. Keith Greene
Project: LANL-WQH Groundwater Samples

Client Sample ID: CAWR-14-89222
Sample ID: 360425009

Project: ESHL00714
Client ID: ARSL004

| Parameter | Qualifier | Result | Uncertainty | MDC | Lc | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Surrogate/Tracer Recovery | Test | Batch ID | Recovery% | Acceptable Limits |
|---|---|---|---|---|

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

# Quality Control Data

# GEL LABORATORIES LLC

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## QC Summary

**Report Date: November 28, 2014**


**Client :** **Los Alamos National Laboratory**
**TA-03, SM271, Drop Pt. 02U, Rm111**

**Los Alamos, New Mexico**

**Contact:** **Mr. Keith Greene**

**Workorder:** **360425**

| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1433419 | | | | | | | | | | |
| QC1203202688 360288002 DUP | | | | | | | | | | |
| Uranium-234 | | 159 | | 147 | pCi/L | 0.263 | | (0-1) | JXR1 | 11/18/1412:57 |
| | Uncert: | +/-1.38 | | +/-1.36 | | | | | | |
| | TPU: | +/-11.2 | | +/-10.5 | | | | | | |
| Uranium-235/236 | | 11.7 | | 9.38 | pCi/L | 0.702 | | (0-1) | | |
| | Uncert: | +/-0.418 | | +/-0.382 | | | | | | |
| | TPU: | +/-0.923 | | +/-0.764 | | | | | | |
| Uranium-238 | | 170 | | 156 | pCi/L | 0.316 | | (0-1) | | |
| | Uncert: | +/-1.43 | | +/-1.40 | | | | | | |
| | TPU: | +/-12.0 | | +/-11.1 | | | | | | |
| **Uranium-232 Tracer | 7.29 | 2.80 | | 2.71 | pCi/L | | 37.2 * | (50%-105%) | | |
| | Uncert: | +/-0.303 | | +/-0.310 | | | | | | |
| | TPU: | +/-0.594 | | +/-0.601 | | | | | | |
| QC1203202689 LCS | | | | | | | | | | |
| Uranium-234 | | | | 2.67 | pCi/L | | | | JXR1 | 11/18/1412:57 |
| | Uncert: | | | +/-0.0648 | | | | | | |
| | TPU: | | | +/-0.179 | | | | | | |
| Uranium-235/236 | | | | 0.166 | pCi/L | | | | | |
| | Uncert: | | | +/-0.0191 | | | | | | |
| | TPU: | | | +/-0.0217 | | | | | | |
| Uranium-238 | 2.72 | | | 2.77 | pCi/L | | 102 | (80%-120%) | | |
| | Uncert: | | | +/-0.0659 | | | | | | |
| | TPU: | | | +/-0.185 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.87 | pCi/L | | 85.4 | (50%-105%) | | |
| | Uncert: | | | +/-0.0589 | | | | | | |
| | TPU: | | | +/-0.149 | | | | | | |
| QC1203202687 MB | | | | | | | | | | |
| Uranium-234 | | | | 0.0408 | pCi/L | | | | JXR1 | 11/18/1412:57 |
| | Uncert: | | | +/-0.00967 | | | | | | |
| | TPU: | | | +/-0.010 | | | | | | |
| Uranium-235/236 | | | U | 0.00187 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00494 | | | | | | |
| | TPU: | | | +/-0.00494 | | | | | | |
| Uranium-238 | | | U | 0.0196 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00724 | | | | | | |
| | TPU: | | | +/-0.00734 | | | | | | |
| **Uranium-232 Tracer | 2.19 | | | 1.96 | pCi/L | | 89.8 | (50%-105%) | | |
| | Uncert: | | | +/-0.0579 | | | | | | |
| | TPU: | | | +/-0.148 | | | | | | |
| Batch 1437369 | | | | | | | | | | |
| QC1203212996 360285003 DUP | | | | | | | | | | |
| Americium-241 | U | 0.277 | U | 0.111 | pCi/L | 0.402 | | (0-1) | JXR1 | 11/19/1415:10 |

## QC Summary

**Workorder: 360425**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1437369 | | | | | | | | | | |
| | Uncert: | +/-0.147 | | +/-0.0587 | | | | | | |
| | TPU: | +/-0.148 | | +/-0.0589 | | | | | | |
| **Americium-243 Tracer | 21.4 | 11.0 | | 17.3 | pCi/L | | 80.7 | (50%-105%) | | |
| | Uncert: | +/-0.859 | | +/-0.687 | | | | | | |
| | TPU: | +/-1.37 | | +/-1.16 | | | | | | |
| QC1203212997 LCS | | | | | | | | | | |
| Americium-241 | 1.41 | | | 1.41 | pCi/L | | 99.7 | (80%-120%) | JXR1 | 11/19/1415:08 |
| | Uncert: | | | +/-0.0515 | | | | | | |
| | TPU: | | | +/-0.0779 | | | | | | |
| **Americium-243 Tracer | 2.14 | | | 2.04 | pCi/L | | 95.2 | (50%-105%) | | |
| | Uncert: | | | +/-0.0629 | | | | | | |
| | TPU: | | | +/-0.109 | | | | | | |
| QC1203212995 MB | | | | | | | | | | |
| Americium-241 | | | U | 0.0151 | pCi/L | | | | JXR1 | 11/19/1415:22 |
| | Uncert: | | | +/-0.00642 | | | | | | |
| | TPU: | | | +/-0.00645 | | | | | | |
| **Americium-243 Tracer | 2.14 | | | 1.95 | pCi/L | | 91.3 | (50%-105%) | | |
| | Uncert: | | | +/-0.0567 | | | | | | |
| | TPU: | | | +/-0.102 | | | | | | |
| Batch 1437370 | | | | | | | | | | |
| QC1203212999 360285003 DUP | | | | | | | | | | |
| Plutonium-238 | U | -0.0217 | U | 0.0669 | pCi/L | 0.462 | | (0-1) | JXR1 | 11/19/1415:22 |
| | Uncert: | +/-0.0486 | | +/-0.0473 | | | | | | |
| | TPU: | +/-0.0486 | | +/-0.0474 | | | | | | |
| Plutonium-239/240 | U | 0.109 | U | 0.00 | pCi/L | 0.551 | | (0-1) | | |
| | Uncert: | +/-0.0575 | | +/-0.041 | | | | | | |
| | TPU: | +/-0.0577 | | +/-0.041 | | | | | | |
| **Plutonium-242 Tracer | 19.7 | 14.5 | | 15.7 | pCi/L | | 79.7 | (50%-105%) | | |
| | Uncert: | +/-0.657 | | +/-0.574 | | | | | | |
| | TPU: | +/-1.08 | | +/-0.982 | | | | | | |
| QC1203213000 LCS | | | | | | | | | | |
| Plutonium-238 | | | U | 0.0081 | pCi/L | | | (80%-120%) | JXR1 | 11/19/1415:22 |
| | Uncert: | | | +/-0.00584 | | | | | | |
| | TPU: | | | +/-0.00585 | | | | | | |
| Plutonium-239/240 | 1.97 | | | 1.99 | pCi/L | | 101 | (80%-120%) | | |
| | Uncert: | | | +/-0.057 | | | | | | |
| | TPU: | | | +/-0.0982 | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.58 | pCi/L | | 80.3 | (50%-105%) | | |
| | Uncert: | | | +/-0.0565 | | | | | | |
| | TPU: | | | +/-0.0971 | | | | | | |
| QC1203212998 MB | | | | | | | | | | |
| Plutonium-238 | | | U | 0.00 | pCi/L | | | | JXR1 | 11/19/1415:22 |
| | Uncert: | | | +/-0.00254 | | | | | | |
| | TPU: | | | +/-0.00254 | | | | | | |
| Plutonium-239/240 | | | U | -0.0018 | pCi/L | | | | | |
| | Uncert: | | | +/-0.00476 | | | | | | |

## QC Summary

**Workorder:** **360425**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Alpha Spec** | | | | | | | | | | |
| Batch 1437370 | | | | | | | | | | |
| | TPU: | | | +/-0.00476 | | | | | | |
| **Plutonium-242 Tracer | 1.97 | | | 1.48 | pCi/L | | 75.1 | (50%-105%) | | |
| | Uncert: | | | +/-0.0597 | | | | | | |
| | TPU: | | | +/-0.101 | | | | | | |
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1434033 | | | | | | | | | | |
| QC1203204248 360431003 DUP | | | | | | | | | | |
| Cesium-137 | U | -2.75 | U | -1.06 | pCi/L | 0.324 | | (0-1) | MJH1 | 11/10/1408:10 |
| | Uncert: | +/-1.26 | | +/-1.17 | | | | | | |
| | TPU: | +/-1.41 | | +/-1.20 | | | | | | |
| Cobalt-60 | U | 1.11 | U | -1.13 | pCi/L | 0.445 | | (0-1) | | |
| | Uncert: | +/-1.14 | | +/-1.32 | | | | | | |
| | TPU: | +/-1.17 | | +/-1.35 | | | | | | |
| Neptunium-237 | U | 1.67 | U | 4.53 | pCi/L | 0.253 | | (0-1) | | |
| | Uncert: | +/-2.50 | | +/-2.95 | | | | | | |
| | TPU: | +/-2.53 | | +/-3.13 | | | | | | |
| Potassium-40 | U | -30.9 | U | 20.4 | pCi/L | 0.665 | | (0-1) | | |
| | Uncert: | +/-15.6 | | +/-21.4 | | | | | | |
| | TPU: | +/-17.2 | | +/-21.4 | | | | | | |
| Sodium-22 | U | 1.71 | U | 2.23 | pCi/L | 0.101 | | (0-1) | | |
| | Uncert: | +/-1.22 | | +/-1.26 | | | | | | |
| | TPU: | +/-1.28 | | +/-1.27 | | | | | | |
| QC1203204249 LCS | | | | | | | | | | |
| Americium-241 | 34500 | | | 37200 | pCi/L | | 108 | (80%-120%) | MJH1 | 11/07/1410:24 |
| | Uncert: | | | +/-362 | | | | | | |
| | TPU: | | | +/-1740 | | | | | | |
| Cesium-137 | 13900 | | | 14500 | pCi/L | | 104 | (80%-120%) | | |
| | Uncert: | | | +/-180 | | | | | | |
| | TPU: | | | +/-611 | | | | | | |
| Cobalt-60 | 16700 | | | 17200 | pCi/L | | 103 | (80%-120%) | | |
| | Uncert: | | | +/-218 | | | | | | |
| | TPU: | | | +/-736 | | | | | | |
| Neptunium-237 | | | U | -70.3 | pCi/L | | | | | |
| | Uncert: | | | +/-79.6 | | | | | | |
| | TPU: | | | +/-81.3 | | | | | | |
| Potassium-40 | | | U | -114 | pCi/L | | | | | |
| | Uncert: | | | +/-160 | | | | | | |
| | TPU: | | | +/-162 | | | | | | |
| Sodium-22 | | | U | -16.7 | pCi/L | | | | | |
| | Uncert: | | | +/-25.9 | | | | | | |
| | TPU: | | | +/-26.2 | | | | | | |
| QC1203204247 MB | | | | | | | | | | |
| Cesium-137 | | | U | 2.67 | pCi/L | | | | MJH1 | 11/07/1411:37 |
| | Uncert: | | | +/-1.66 | | | | | | |
| | TPU: | | | +/-1.77 | | | | | | |
| Cobalt-60 | | | U | 3.12 | pCi/L | | | | | |

## QC Summary

**Workorder:** **360425**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec** | | | | | | | | | | |
| Batch 1434033 | | | | | | | | | | |
| | Uncert: | | | +/-1.81 | | | | | | |
| | TPU: | | | +/-1.95 | | | | | | |
| Neptunium-237 | | | U | -3.18 | pCi/L | | | | | |
| | Uncert: | | | +/-3.21 | | | | | | |
| | TPU: | | | +/-3.30 | | | | | | |
| Potassium-40 | | | U | -35 | pCi/L | | | | | |
| | Uncert: | | | +/-17.7 | | | | | | |
| | TPU: | | | +/-19.5 | | | | | | |
| Sodium-22 | | | U | -0.759 | pCi/L | | | | | |
| | Uncert: | | | +/-1.52 | | | | | | |
| | TPU: | | | +/-1.53 | | | | | | |
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1433352 | | | | | | | | | | |
| QC1203202543 360431003 DUP | | | | | | | | | | |
| Alpha | U | 0.255 | U | 0.227 | pCi/L | 0.0144 | | (0-1) | JXH3 | 11/19/1420:07 |
| | Uncert: | +/-0.604 | | +/-0.381 | | | | | | |
| | TPU: | +/-0.604 | | +/-0.382 | | | | | | |
| Beta | U | 1.96 | U | 0.612 | pCi/L | 0.629 | | (0-1) | | 11/18/1421:01 |
| | Uncert: | +/-0.620 | | +/-0.425 | | | | | | |
| | TPU: | +/-0.641 | | +/-0.428 | | | | | | |
| QC1203202546 LCS | | | | | | | | | | |
| Alpha | 12.2 | | | 13.0 | pCi/L | | 107 | (80%-120%) | JXH3 | 11/19/1414:52 |
| | Uncert: | | | +/-0.660 | | | | | | |
| | TPU: | | | +/-1.27 | | | | | | |
| Beta | 47.7 | | | 50.8 | pCi/L | | 107 | (80%-120%) | | 11/19/1408:46 |
| | Uncert: | | | +/-0.935 | | | | | | |
| | TPU: | | | +/-4.39 | | | | | | |
| QC1203202542 MB | | | | | | | | | | |
| Alpha | | | U | 0.0592 | pCi/L | | | | JXH3 | 11/19/1414:59 |
| | Uncert: | | | +/-0.0938 | | | | | | |
| | TPU: | | | +/-0.094 | | | | | | |
| Beta | | | U | 0.0391 | pCi/L | | | | | 11/18/1418:37 |
| | Uncert: | | | +/-0.112 | | | | | | |
| | TPU: | | | +/-0.112 | | | | | | |
| QC1203202544 360431003 MS | | | | | | | | | | |
| Alpha | 243 U | 0.255 | | 288 | pCi/L | | 118 | (75%-125%) | JXH3 | 11/19/1414:52 |
| | Uncert: | +/-0.604 | | +/-14.3 | | | | | | |
| | TPU: | +/-0.604 | | +/-28.2 | | | | | | |
| Beta | 954 U | 1.96 | | 1130 | pCi/L | | 118 | (75%-125%) | | 11/18/1418:23 |
| | Uncert: | +/-0.620 | | +/-19.6 | | | | | | |
| | TPU: | +/-0.641 | | +/-96.9 | | | | | | |
| QC1203202545 360431003 MSD | | | | | | | | | | |
| Alpha | 243 U | 0.255 | | 275 | pCi/L | 0.115 | 113 | (0-1) | JXH3 | 11/19/1414:52 |
| | Uncert: | +/-0.604 | | +/-13.9 | | | | | | |
| | TPU: | +/-0.604 | | +/-27.1 | | | | | | |
| Beta | 954 U | 1.96 | | 1170 | pCi/L | 0.0985 | 123 | (0-1) | | 11/18/1418:23 |

## QC Summary

**Workorder:** **360425**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gas Flow** | | | | | | | | | | |
| Batch 1433352 | | | | | | | | | | |
| | Uncert: | +/-0.620 | | +/-20.5 | | | | | | |
| | TPU: | +/-0.641 | | +/-103 | | | | | | |
| Batch 1434929 | | | | | | | | | | |
| QC1203206648 360053003 DUP | | | | | | | | | | |
| Strontium-90 | U | -0.163 | U | 0.100 | pCi/L | 0.479 | | (0-1) | KSD1 | 11/23/1414:28 |
| | Uncert: | +/-0.126 | | +/-0.148 | | | | | | |
| | TPU: | +/-0.126 | | +/-0.148 | | | | | | |
| **Strontium Carrier | 7.65 | 6.80 | | 6.30 | mg | | 82.4 | (50%-105%) | | |
| QC1203206650 LCS | | | | | | | | | | |
| Strontium-90 | 23.9 | | | 23.4 | pCi/L | | 98 | (80%-120%) | KSD1 | 11/22/1413:26 |
| | Uncert: | | | +/-0.638 | | | | | | |
| | TPU: | | | +/-1.97 | | | | | | |
| **Strontium Carrier | 7.65 | | | 7.00 | mg | | 91.5 | (50%-105%) | | |
| QC1203206647 MB | | | | | | | | | | |
| Strontium-90 | | | U | 0.153 | pCi/L | | | | KSD1 | 11/23/1414:27 |
| | Uncert: | | | +/-0.137 | | | | | | |
| | TPU: | | | +/-0.138 | | | | | | |
| **Strontium Carrier | 7.65 | | | 6.80 | mg | | 88.9 | (50%-105%) | | |
| QC1203206649 360053003 MS | | | | | | | | | | |
| Strontium-90 | 239 U | -0.163 | | 237 | pCi/L | | 99.1 | (75%-125%) | KSD1 | 11/22/1413:26 |
| | Uncert: | +/-0.126 | | +/-6.20 | | | | | | |
| | TPU: | +/-0.126 | | +/-20.1 | | | | | | |
| **Strontium Carrier | 7.65 | 6.80 | | 7.20 | mg | | 94.1 | (50%-105%) | | |

**Notes:**

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

| | |
|---|---|
| ** | Analyte is a Tracer compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| BD | Results are either below the MDC or tracer recovery is low |
| FA | Failed analysis. |
| H | Analytical holding time was exceeded |
| J | Value is estimated |
| K | Analyte present. Reported value may be biased high. Actual value is expected to be lower. |
| L | Analyte present. Reported value may be biased low. Actual value is expected to be higher. |
| M | M if above MDC and less than LLD |
| M | REMP Result > MDC/CL and < RDL |
| N/A | RPD or %Recovery limits do not apply. |
| N1 | See case narrative |
| ND | Analyte concentration is not detected above the detection limit |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. |

## QC Summary

**Workorder:** **360425**



| Parmname | NOM | Sample | Qual | QC | Units | RER | REC% | Range | Anlst | Date Time |
|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| R | Sample results are rejected |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. |
| UI | Gamma Spectroscopy--Uncertain identification |
| UJ | Gamma Spectroscopy--Uncertain identification |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | Other specific qualifiers were required to properly define the results. Consult case narrative. |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. |
| h | Preparation or preservation holding time was exceeded |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
** Indicates analyte is a surrogate/tracer compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

American Radiation Services - Primary

1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADep

**COC/Lab Request #:** 2015-230



**Client Contact:**

**Lab Agreement # :** 63641-001-10

**Project Number :**

**Analysis Turnaround Time:**

- 24 Hour - ☐
- 7 Day - ☐
- 14 Day - ☐
- 21 Day - ☐
- 28 Day - ☒
- Other - ☐

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-89229 | Oct 30 2014 | 13:40 | W | 1 |
| CAWR-14-89222 | Oct 30 2014 | 13:40 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martinez | 11/5/14 3:00 | | | |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89222

**WORK ORDER:**

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Sacred Spring | | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: | | ↓ | FIELD QC TYPE: | FD | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | QC | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MA |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS 10/30/14 | 1 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS 10/30/14 | 1 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 1 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS 10/30/14 | 1 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS 10/30/14 | 2 | ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89222 **WORK ORDER:**

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | ~~2~~ 1 | ICE | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

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**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**

AS 10/30/14

**FIELD PARAMETERS:**

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

**COLLECTED BY (PRINT)** A. Stocker, A. Toth + D. Jaramillo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stocker | 10/30/14 1605 | S. Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 10/08/2014

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955

**EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89229

**WORK ORDER:** NA

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---|---|---|---|---|---|
| DATE COLLECTED (MM/DD/YYYY): | | 10/30/2014 | FIELD MATRIX: | WG | ok |
| TIME COLLECTED (HH:MM): | | 1340 | MEDIA: | UA | ↓ |
| PRS ID: | | ok | SAMPLE TECH CODE: | UA | PP |
| LOCATION ID: Sacred Spring | | ↓ | FIELD PREP: | UF | ok |
| LOCATION TYPE: SPR | | ↓ | FIELD QC TYPE: | REG | ↓ |
| PORT: | | ↓ | SAMPLE USAGE: | INV | ↓ |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| MS | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | MS |
| | WSP-8011-EDB_DBCP | 40 ML SEPTUM AMBER GLASS | 2 | Na2S2O3 | | |
| | WSP-8082-PCB | 1 LITER AMBER GLASS MS 10/30/14 | 2 | ICE | | |
| | WSP-8260B-VOA | 40 ML SEPTUM AMBER GLASS | 2 | HCL | | |
| | WSP-8270C-SVOA | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8310-PAH | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-8321A-NMED HEXP | 1 LITER AMBER GLASS MS 10/30/14 | 2 | ICE | | |
| | WSP-CN(T) | 250 ML POLY | 1 | NAOH | | |
| | WSP-GrossA/B | 1 LITER POLY | 1 | HNO3 | | |
| | WSP-LL-8151A-PCP | 1 LITER AMBER GLASS | 2 | ICE | | |

Analyses continued on next page

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

**EVENT ID:** 6955 **EVENT NAME:** White Rock Canyon and Rio Grande Watershed MY2015 Q1 Sampling Event_MOU Additions

**SAMPLE ID:** CAWR-14-89229 **WORK ORDER:** NA

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|
| NA | WSP-LL-8260B | 40 ML SEPTUM AMBER GLASS | 2 | HCL | Y | NA |
| | WSP-LL-8270C | 1 LITER AMBER GLASS | 2 | ICE | | |
| | WSP-LL-H-3 | 1 LITER POLY | 1 | NONE | | |
| | WSP-RAD | 1 GAL POLY | 1 | HNO3 | | |
| | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | | |

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**SAMPLE COMMENTS:**

NA

**LOCATION COMMENTS:**

NA

**FIELD PARAMETERS:**

Dissolved Oxygen 3.70 mg/L Flow (in gpm) 4.49 GPM Oxidation-Reduction Potential NA mV

pH 7.33 SU Specific Conductance 365 uS/cm Temperature 12.94 deg C

Turbidity 10.9 NTU

**COLLECTED BY (PRINT)** A. Toth + D. Jaramillo

| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |
|---|---|---|---|
| Andrew Stacker | 10/30/14 1605 | S. Sherwood | 10/30/14 1605 |
| **RELINQUISHED BY (Printed Name) (Signature)** | **Date/Time** | **RECEIVED BY (Printed Name) (Signature)** | **Date/Time** |

Report Date 10/08/2014

# DATA VALIDATION REPORT

Chain Of Custody No. 2015-230

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|---|---|---|---|---|---|---|
| ARS1-14-03068 | Generic:Low_Level_Tritium | 1 | 1 | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-14-03068 | Generic:Low_Level_Tritium | ARS1-B14- | ARS1-B14- | 1 | 1 | | | | 1 | | | | | 1 | 1 | | | | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|---|---|---|---|---|---|---|---|---|
| Generic:Low_Level_Tritium | RAD | CAWR-14-89222 | ARS1-B14-02922-10 | FD | 1 | 0 | 0 | 0 |
| Generic:Low_Level_Tritium | RAD | CAWR-14-89229 | ARS1-B14-02922-09 | REG | 1 | 0 | 0 | 0 |
| Generic:Low_Level_Tritium | RAD | LCS | ARS1-B14-02922-01 | LCS | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | LCSD | ARS1-B14-02922-02 | LCSD | 0 | 0 | 1 | 0 |
| Generic:Low_Level_Tritium | RAD | MB | ARS1-B14-02922-03 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

# DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

| LCS Lab Sample | LCSD Lab | Analytical Method | Parameter Name | Lab Lot ID | Analysis | Sample Matrix | LCS Spike Recovery | LCSD Spike Recovery | Upper Limit | Lower Limit | Upper Rejection Limit | Lower Rejection Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02922-01 | ARS1-B14-02922-02 | Generic:Low_Level_Tritium | Tritium | ARS1-B14-02922 | 12-06-2014 | W | 89.000 | 56.000 | 120.00 | 80.000 | | 10 | 46.777 | |

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

# DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Paramter Name | Lab Qualifier | Validation Qualifier | Validation Reason Codes | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sacred Spring | 2015-230 | CAWR-14-89222 | FD | INIT | RAD | Generic:Low_Level_Tritiu | Tritium | U | U | R5 | N | 0.4330 | pCi/L | 0.4330 | pCi/L | 2.6090 | 0.7780 | W | 10/30/2014 | | ARS1-B14-02922 | VAL | Y |
| Sacred Spring | 2015-230 | CAWR-14-89229 | REG | INIT | RAD | Generic:Low_Level_Tritiu | Tritium | U | U | R5 | N | 0.5060 | pCi/L | 0.5060 | pCi/L | 2.4580 | 0.7360 | W | 10/30/2014 | | ARS1-B14-02922 | VAL | Y |

| Reason Code | Description |
|---|---|
| R5 | Analyte is not detected because the amount reported is less than the MDC. |

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|---|---|---|---|---|---|
| CAWR-14-89222 | Sacred Spring | FD | Generic:Low_Level_Tritium | 0 | 1 |
| CAWR-14-89229 | Sacred Spring | REG | Generic:Low_Level_Tritium | 0 | 1 |

INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Request Number: 2015-230

INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory Request: 2015-230

# Original COC

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADep

COC/Lab Request #: 2015-230



**Client Contact:**

**Lab Agreement #:** 63641-001-10

**Project Number:**

**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-89229 | Oct 30 2014 | 13:40 | W | 1 |
| CAWR-14-89222 | Oct 30 2014 | 13:40 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martz | 11/5/14 3:00 | | Cheryl G. Reaves | 11/6/14 11:30 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory Request: 2015-230

# Case Narrative

ARS INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

December 9, 2014

LANL
Keith Greene
PO Box 1663 MS M992
Los Alamos, NM 87545

Request Number: **2015-230**
LANL Sample ID: **CAWR-14-89229; CAWR-14-89222**

Dear Mr. Greene;

On November 6, 2014, ARS International received two (2) water samples to be analyzed for Low Level Tritium.

Samples were counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The client and QA/QC samples were counted with a count time sufficient to meet quality control parameters for counting equipment and were within acceptance criteria and statistical sound detection limits.

If you have any questions please do not hesitate to call at 225.381.2991 or email LANL@amrad.com.

Sincerely,

James D. Fu

Laboratory Management
**ARS International**

ARS INTERNATIONAL
2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

# COVER PAGE

## PROJECT SAMPLE IDENTIFICATION CROSS-REFERENCE TO ARS SAMPLE LABORATORY IDs

Subcontract (LANL Agreement Number) 250953

| Request Number | LANL PROJECT SAMPLE ID NUMBER | American Radiation Services SAMPLE ID NUMBER(S) |
|---|---|---|
| 2015-230 | CAWR-14-89229 | ARS1-14-03068-001 |
| 2015-230 | CAWR-14-89222 | ARS1-14-03068-002 |

**SAMPLE RECEIPT**

The samples were received in good condition. The samples were screened for radioactive contamination as per procedure **ARS-062 "Sample Receiving"**. A 28-day turnaround was requested on the chain of custody.

**ANALYTICAL METHODS**

Tritium analyses were performed using **ARS-040, "Tritium Assay in Water Samples Using Electrolytic Enrichment".**

**ANALYTICAL RESULTS**

DER and RER pass at 2 sigma, but duplicate criteria fail when analyzed at 1 sigma.
The result data that are flagged with "U" indicate that the activity is below the MDC.

**American Radiation Services Project Manager/Laboratory Director's Comments:**

*"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."*

*"I certify that this electronic image and all hardcopies produced from this image accurately represent the data and are in compliance with the LANL specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."*

James D. Lu
**Signature**

Laboratory Management, ARS International
**Title**

12-09-14
**Date**

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# ARS International, LLC

## Laboratory Analysis Report

## ARS1-14-03068

*Prepared for:*

**Los Alamos National Laboratory**

**Keith Greene**
**P.O. Box 1663**
**MS M992**
**Los Alamos, NM 87545**
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**Phone: 505-665-9966**
**Fax: 505-665-9972**

Project Manager Review

Management Review

Notes: ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

**Contact Person: Questions regarding this analytical report should be addressed to:**

**Project Manager**

**ProjectManagers@amrad.com**

**Phone: 225.381.2991**
**Fax: 225.381.2996**

ACLASS ACCREDITED DoD ELAP

**LELAP Cert# 01949**

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# Notes:

## Comments:

1.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.

2.0) Data in this report are within the limits of uncertainty specified in the reference method unless otherwise specified.

3.0) Modified analysis procedures are procedures that are modified to meet the certain specifications. An example may be the use of a water method to analyze a solid matrix due to the lack of an officially recognized procedure for the analysis of the solid matrix. Modified analyses are indicated by the subsequent addition of "m" to the procedure number (i.e. 900.0M).

4.0) Derived Air Concentrations and Effluent Release Concentrations are obtained from 10 CFR 20 Appendix B.

5.0) **Total activity** is actually total gamma activity and is determined utilizing the prominent gamma emitters from the naturally occurring radioactive decay chains and other prominent radioactive nuclides. Total activity may be lower than the actual total activity due to the extent of secular equilibrium achieved in the various decay chains at the time of analysis. The total activity is not representative of nuclides that emit solely alpha or beta particles.

6.0) Ra-228 is determined via secular equilibrium with its daughter, Actinium 228 (Gamma Spectroscopy only).

7.0) U-238 is determined via secular equilibrium with its daughter, Thorium 234 (Gamma Spectroscopy only).

8.0) All gamma spectroscopy was performed utilizing high purity germanium detectors (**HPGe**).

9.0) ARS makes every attempt to match sample density to calibrated density; however, in some cases, it is not practical or possible to do so and data results may be affected (Gamma Spectroscopy only).

10.0) Gamma spectroscopy results are calculated values based on the **ORTEC**® GammaVision ENV32 Analysis Engine.

11.0) ACLASS DOD and ISO 17025 certification applies only to the following analytes and methods: Gross Alpha and Gross Beta (EPA 900, SM7110B&C, SW846 9310); Radium 226 (EPA 903, EPA 903.1, SM 7500 Ra-B, SW846 9315); Radium 228 (EPA 904, SM 7500 Ra-B SW846 9320); Iodine-131(EPA 901.1); Uranium by ICPMS (EPA 200.8); Strontium 89/90 (EPA 905, Eichrom SRW01, HASL 300 Sr-03-RC); Tritium (EPA 906, EPA 906M); Gamma Emitters (EPA 901.1, SM7120B, HASL 300 Ga-01-R); Americium-241, Curium 242/244, Plutonium 239/240 and 241, Thorium 228/230/232, Uranium 234/233 and 238 (Eichrom ACW03 VBS); Lead 210 (HASL 300 Pb-01-RC, Eichrom OTW01); Polonium 210 (HASL 300 Po-01-RC, HASL 300 Po-02-RC); Technetium-99 (Eichrom TCW02, Eichrom TCS01M).

## Method References:

1.0) **EPA 600/4-80-032**; Prescribed Procedures for the Measurements of Radioactivity in Drinking Water, August 1980.

2.0) Standard Methods for Examination of Water and Waste Water, 18th, 1992.

3.0) **EPA SW-846**; Test Methods for Evaluating Solid Waste, Third Edition, (9/86). (Updated through 1995).

4.0) **EPA 600/4/79-020**; Methods for Chemical Analysis of Water and Waste, March 1983.

5.0) **HASL 300**

6.0) **ARS-040**; An LCSD is not reported with this process. The criteria for the LCS/LCSD analysis for reproducibility have not been established for Low Level Tritium analysis. A prepared standard for Low Level Tritium has not been developed. As a result, the standard we use is based on the dilution of a verified conventional tritium standard. The volume required for Low Level Tritium analysis, in addition to the lack of an available Low Level Tritium standard, introduce variability into the LCS/LCSD analysis that does not represent the actual sample analysis. The preferred measure for reproducibility is to run a duplicate analysis of a sample.

## Definitions:

| | | |
|---|---|---|
| 1.0) | **ND** | Not detected above the detection limit (non-detect). |
| 2.0) | **MDC** | (Minimum Detectable Concentration) minimum concentration of the analyte that ARS can detect utilizing the specific analysis |
| 3.0) | **MBL** | Method Blank |
| 4.0) | **DO** | Duplicate Original |
| 5.0) | **DUP** | Method Duplicate |
| 6.0) | **MS/MSD** | Matrix Spike/Matrix Spike Duplicate |
| 7.0) | **S** | Spike |
| 8.0) | **RS** | Reference Spike |
| 9.0) | ***SC** | Subcontracted out to another qualified laboratory |
| 10.0) | **NR** | Not Referenced |
| 11.0) | **N/A** | Not Applicable |
| 13.0) | **U** | Activity is below the MDC |
| 14.0) | **LCS/LCSD** | Laboratory Control Standard/Laboratory Control Standard Duplicate |
| 15.0) | **DLC** | Decision Level Concentration (ANSI N42.23) or critical level |

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***LELAP Cert# 01949*** ***NELAP Cert# E87558***

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# American Radiation Services Analytical Reports

## for

## Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

2609 North River Road, Port Allen, Louisiana 70767
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ARS INTERNATIONAL

**ARS Sample Delivery Group:** ARS1-14-03068
**Client Sample ID:** CAWR-14-89229
**Sample Collection Date:** 10/30/14
**Sample Matrix:** Aqueous

**Request or PO Number:** 2015-230
**ARS Sample ID:** ARS1-14-03068-001
**Date Received:** 11/06/14
**Report Date:** 12/09/14

| Analysis Description | Analysis Results | CSU +/- 1 s | MDC | DLC | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|---|---|---|---|---|---|---|---|---|---|---|
| Enriched H-3 | 0.506 | 0.736 | 2.458 | 1.186 | U | pCi/L | ARS-040 | 12/07/14 05:35 | JPB | NA |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**NOTES:**

Project Manager Review

***Notes:*** *ARS International, LLC assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of ARS International, LLC. The results in this report pertain only to the samples tested and are intended solely for the use of the client.*

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ARS INTERNATIONAL

**ARS Sample Delivery Group:** ARS1-14-03068
**Client Sample ID:** CAWR-14-89222
**Sample Collection Date:** 10/30/14
**Sample Matrix:** Aqueous

**Request or PO Number:** 2015-230
**ARS Sample ID:** ARS1-14-03068-002
**Date Received:** 11/06/14
**Report Date:** 12/09/14

| Analysis Description | Analysis Results | CSU +/- 1 s | MDC | DLC | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|---|---|---|---|---|---|---|---|---|---|---|
| Enriched H-3 | 0.433 | 0.778 | 2.609 | 1.259 | U | pCi/L | ARS-040 | 12/07/14 09:46 | JPB | NA |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**NOTES:**

Project Manager Review

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# QC Results Report

**Sample Delivery Group:** ARS1-14-03066;67;68
**Date Received:** 11/6/2014

## Laboratory Control Sample Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Percent Recovery (%) | LCS Acceptance Range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02922 | LCS | H3 | 21.461 | 3.437 | 2.808 | 24.241 | | pCi/L | ARS-040 | 12/5/14 22:17 | JPB | 89 | 80%-120% |

## Blank Evaluation

| Analysis Batch | QC Type | Analyte | Analysis Results | CSU 1 (1s) | MDC | Expected Value | Qual | Report Units | Analysis Test Method | Analysis Date/Time | Analysis Technician |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02922 | MBL | H3 | 0.740 | 0.641 | 2.096 | NA | U | pCi/L | ARS-040 | 12/5/14 22:17 | JPB |

## Sample RER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | RER | RER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02922 | LCSD | H3 | 21.461 | 3.437 | 13.325 | 2.255 | | pCi/L | ARS-040 | 12/5/14 22:17 | JPB | 1.43 | < 1 |

## Sample DER Duplicate Evaluation

| Analysis Batch | QC Type | Analysis Description | Result 1 | CSU 1 (1s) | Result 2 | CSU 2 (1s) | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | DER | DER AcceptanceRange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02922 | LCSD | H3 | 21.461 | 3.437 | 13.325 | 2.255 | | pCi/L | ARS-040 | 12/5/14 22:17 | JPB | 3.96 | < 3 |

Project Manager Review

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# QC Evaluation

**EPA Method: ARS-040**
**Batch ID: ARS1-B14-02922**
**SDG's: ARS1-14-03066; 3067; 3068**

| | | | |
|---|---|---|---|
| **LCS** | 21.4610 | **CSU (2s)** | 6.7360 |
| **LCSD** | 13.3250 | **CSU-D (2s)** | 4.4190 |

**DER =** $\frac{\text{abs(LSC-LSCD)}}{\text{sqr((2s CSU/2)^2)+(( 2s CSU-D/2)^2)}}$ = **< 3**

*at 1 sigma*

**DER** $\frac{8.136}{4.028066}$ = 2.019828 **< 3**

**% RPD=** $\frac{\text{ABS( LCS - LSCD)}}{\text{(LCS+LCSD)/2}}$ * 100 = **< 25%**

**%RPD** $\frac{8.136}{17.393}$ *100 = 46.77744 **< 25%**

The *RPD* shall be less than 25% or other client-applied criteria

**RER=** $\frac{\text{abs((LCS-LCSD))}}{\text{(CSU)+(CSD)}}$ = **<1** ***<--LANL Requirement***

*at 2 sigma*

**RER =** $\frac{8.136}{11.1550}$ 0.729359032 **<1**

**Blank Information**

| | Act | CSU(2s) | MDA | Act>MDA |
|---|---|---|---|---|
| **AM-241** | | | | |
| **U-234** | | | | |
| **U-235** | | | | |
| **U-238** | | | | |
| **Pu-238** | | | | |
| **Pu-239/240** | | | | |
| **Th-228** | | | | |
| **Th-230** | | | | |
| **Th-232** | | | | |
| **H3** | 0.74 | 1.255 | 2.096 | |
| **Ra-226** | | | | |
| **Ra-228** | | | | |
| **Total U** | | | | |
| **Pb-210** | | | | |
| **Po-209** | | | | |
| **Sr-90** | | | | |
| **TC-99** | | | | |
| **NI-63** | | | | |

*MDA should be below RDL
*Blank activity must be below MDA
*Blank activity must be < 1.65*CSU (DOE only)

ACT = 0.74
CSU = 1.255
Is ACT<1.65*CSU? YES

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-02922**

| **Method** | **ARS-040** | **Analysis** | **LSC-A-022** | **Matrix** | **AQ** |
|---|---|---|---|---|---|
| **Description** | **Low Level Tritium by Electrolytic Enrichment** | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02922-01 | LCS | B-17876 | | | | | | | | |
| ARS1-B14-02922-02 | LCSD | B-17877 | | | | | | | | |
| ARS1-B14-02922-03 | MBL | | | | | | | | | |
| ARS1-B14-02922-04 | TRG | | | | **ARS1-14-03066** | 001 | 1 | CAPA-14-87182 | STD | 12/01/14 |
| ARS1-B14-02922-05 | TRG | | | | **ARS1-14-03066** | 002 | 1 | CAPA-14-87204 | STD | 12/01/14 |
| ARS1-B14-02922-06 | TRG | | | | **ARS1-14-03066** | 003 | 1 | CAPA-14-87154 | STD | 12/01/14 |
| ARS1-B14-02922-07 | TRG | | | | **ARS1-14-03066** | 004 | 1 | CAPA-14-87205 | STD | 12/01/14 |
| ARS1-B14-02922-08 | TRG | | | | **ARS1-14-03067** | 001 | 1 | CAWR-14-89237 | STD | 12/01/14 |
| ARS1-B14-02922-09 | TRG | | | | **ARS1-14-03068** | 001 | 1 | CAWR-14-89229 | STD | 12/01/14 |
| ARS1-B14-02922-10 | TRG | | | | **ARS1-14-03068** | 002 | 1 | CAWR-14-89222 | STD | 12/01/14 |

American Radiation Services
Baton Rouge Laboratory

# LCS Report
## Analytical Batch: ARS1-B14-02922

Printed: 12/8/2014 12:01 PM


| BlindID | ABatch | ABatchSampleID | BlindGroup | StdID | Isotope | ExpectedAddition | ExpectedValue | EmptyWt | GrossWt | NetWt | UserID | ModDate | ExpectedValue_CT | MidPointCountDate | KnownValue |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-17876 | ARS1-B14-02922 | ARS1-B14-02922-01 | B-H3 | S-0289 | H-3 | 5 | 2.396986105 | 13.118 | 18.197 | 5.079 | AMRAD\BSTEFFENS | 11/13/2014 | 2.388876781 | 12/5/2014 | 12.13310517 |
| B-17877 | ARS1-B14-02922 | ARS1-B14-02922-02 | B-H3 | S-0289 | H-3 | 5 | 2.396986105 | 13.248 | 18.289 | 5.041 | AMRAD\BSTEFFENS | 11/13/2014 | 2.388508828 | 12/6/2014 | 12.040473 |

# ARS-040



| ID_31001_040 | ABatch | AnalysisCode | ABatchSampleID | ClientID | IC_ID | S01_1_EnrichCellNo |
|---|---|---|---|---|---|---|
| 1294 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-01 | | | 0 |
| 1295 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-02 | | | 0 |
| 1296 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-03 | | | 0 |
| 1297 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-04 | CAPA-14-87182 | | 0 |
| 1298 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-05 | CAPA-14-87204 | | 0 |
| 1299 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-06 | CAPA-14-87154 | | 0 |
| 1300 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-07 | CAPA-14-87205 | | 0 |
| 1301 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-08 | CAWR-14-89237 | | 0 |
| 1302 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-09 | CAWR-14-89229 | | 0 |
| 1303 | ARS1-B14-02922 | LSC-A-022 | ARS1-B14-02922-10 | CAWR-14-89222 | | 0 |

| S01_2_TareCell | S01_3_TareResv | S02_GrossWtResv | S03_1_WtNa2O2 | C_GrossSampleAdded | S04_1_ElectrolSD |
|---|---|---|---|---|---|
| 328.02 | 199.3 | 699.81 | 2 | 500.51 | 11/13/2014 19:03:00 |
| 323.84 | 232.56 | 733.13 | 2.05 | 500.57 | 11/13/2014 19:03:00 |
| 319.42 | 222.22 | 725.16 | 2 | 502.94 | 11/13/2014 19:03:00 |
| 332.5 | 197.65 | 700.72 | 2.08 | 503.07 | 11/13/2014 19:03:00 |
| 326.72 | 195.52 | 696.03 | 2.05 | 500.51 | 11/13/2014 19:03:00 |
| 324.52 | 210.18 | 712.41 | 2.07 | 502.23 | 11/13/2014 19:03:00 |
| 326.11 | 228 | 728.65 | 2 | 500.65 | 11/13/2014 19:03:00 |
| 333.22 | 202.37 | 704.43 | 2 | 502.06 | 11/13/2014 19:03:00 |
| 330.38 | 211.55 | 712.4 | 2.08 | 500.85 | 11/13/2014 19:03:00 |
| 328.2 | 195.78 | 697.91 | 2 | 502.13 | 11/13/2014 19:03:00 |

| S04_2_StartAmp | S04_3_StartBathC | S05_1_ElectrolED | S05_2_EndBathC | S05_3_EndCellWt | C_GrossSmplRec |
|---|---|---|---|---|---|
| 5 | 2 | 12/04/2014 13:27:00 | 2 | 544.87 | 17.55 |
| 5 | 2 | 12/05/2014 07:19:00 | 2 | 573.27 | 16.87 |
| 5 | 2 | 12/05/2014 07:58:00 | 2 | 556.71 | 15.07 |
| 5 | 2 | 12/05/2014 08:01:00 | 2 | 544.8 | 14.65 |
| 5 | 2 | 12/05/2014 08:07:00 | 2 | 538.69 | 16.45 |
| 5 | 2 | 12/05/2014 08:12:00 | 2 | 554.17 | 19.47 |
| 5 | 2 | 12/05/2014 12:55:00 | 2 | 573.84 | 19.73 |
| 5 | 2 | | | | |
| 5 | 2 | 12/05/2014 12:57:00 | 2 | 559.32 | 17.39 |
| 5 | 2 | 12/05/2014 08:23:00 | 2 | 542.31 | 18.33 |

| C_EnrichmentF | S06_TareWt | S07_GrossWt | C_RecoveredWa | S08_TearWtLSCVial | S09_VialPlusSmpl | C_NetSample |
|---|---|---|---|---|---|---|
| 28.51908832 | 102.18 | 113.85 | 11.67 | 6.51 | 16.55 | 10.04 |
| 29.67219917 | 96.21 | 107.58 | 11.37 | 6.54 | 16.64 | 10.1 |
| 33.37358991 | 103.04 | 114.35 | 11.31 | 6.56 | 16.56 | 10 |
| 34.33924915 | 108.9 | 118.91 | 10.01 | 6.47 | 16.64 | 10.17 |
| 30.42613982 | 95.58 | 109.03 | 13.45 | 6.48 | 16.52 | 10.04 |
| 25.79506934 | 113.77 | 128.27 | 14.5 | 6.65 | 16.68 | 10.03 |
| 25.37506336 | 102.16 | 115.9 | 13.74 | 6.46 | 16.72 | 10.26 |
| | | | | | | |
| 28.80103508 | 107.85 | 118.99 | 11.14 | 6.57 | 16.81 | 10.24 |
| 27.3938898 | 120.93 | 131.66 | 10.73 | 6.49 | 16.52 | 10.03 |

| S10_1_WtVislSmplDrWatFill | C_NetDeadWaterAdded | C_TareWtBFCocktail | S10_2_GrossWtVSC | C_NetWtCocktailAdded |
|---|---|---|---|---|
| 16.55 | 0 | 16.55 | 26.73 | 10.18 |
| 16.64 | 0 | 16.64 | 26.86 | 10.22 |
| 16.56 | 0 | 16.56 | 27.03 | 10.47 |
| 16.64 | 0 | 16.64 | 26.96 | 10.32 |
| 16.52 | 0 | 16.52 | 26.58 | 10.06 |
| 16.68 | 0 | 16.68 | 26.99 | 10.31 |
| 16.72 | 0 | 16.72 | 26.8 | 10.08 |
| | | | | |
| 16.81 | 0 | 16.81 | 26.98 | 10.17 |
| 16.52 | 0 | 16.52 | 26.5 | 9.98 |

| UserID | ModDate |
|---|---|
| AMRAD\BFORBES | 12/05/2014 09:21:32 |
| AMRAD\BFORBES | 12/05/2014 09:24:49 |
| AMRAD\BFORBES | 12/05/2014 15:29:10 |
| AMRAD\BFORBES | 12/05/2014 15:31:20 |
| AMRAD\BFORBES | 12/05/2014 15:33:02 |
| AMRAD\BFORBES | 12/05/2014 15:34:47 |
| AMRAD\BFORBES | 12/05/2014 15:36:27 |
| AMRAD\BFORBES | 12/04/2014 08:39:54 |
| AMRAD\BFORBES | 12/05/2014 15:37:45 |
| AMRAD\BFORBES | 12/05/2014 15:39:48 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141205_1757
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141205_1757\20141205_1757.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141205_1757\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141205_1757\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 240.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

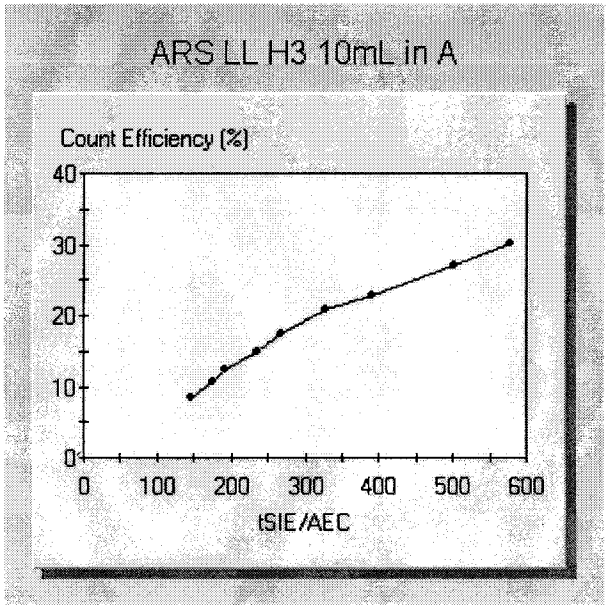
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

24676

# Standards Activity as of: 12/05/14 22:17

| Active | Std ID | Isotope | PSCLT | Verification Date | Exp Date | Status | Ref Date | Ref ACT (dpm) | ACT at Date Above (dpm/g) | Halflife (days) | Parent ID | Expended Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | **S-0289** | H-3 | **SL** | 01/07/14 | 01/07/15 | OK | 01/03/13 | 5.9080E+00 | **5.3033** | 4.500E+03 | **S-0237** | |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 1 | BACKGROUND | 1.096 | 4.83 | 382.90 | 22.70 | 240.00 | 12/5/2014 | 6:06:20 PM | |
| 10 | 2 | B14-02922-01 | 3.585 | 15.66 | 388.52 | 22.89 | 240.00 | 12/5/2014 | 10:17:18 PM | |
| 10 | 3 | B14-02922-02 | 2.702 | 11.97 | 379.27 | 22.57 | 240.00 | 12/6/2014 | 2:28:25 AM | |
| 10 | 4 | B14-02922-03 | 1.211 | 5.21 | 398.85 | 23.27 | 240.00 | 12/6/2014 | 6:39:42 AM | |
| 10 | 5 | B14-02922-04 | 1.060 | 4.65 | 385.42 | 22.78 | 240.00 | 12/6/2014 | 10:50:49 AM | |
| 10 | 6 | B14-02922-05 | 1.160 | 5.09 | 385.87 | 22.80 | 240.00 | 12/6/2014 | 3:01:55 PM | |
| 10 | 7 | B14-02922-06 | 1.025 | 4.47 | 390.15 | 22.95 | 240.00 | 12/6/2014 | 7:13:00 PM | |
| 10 | 8 | B14-02922-07 | 1.108 | 4.92 | 378.19 | 22.53 | 240.00 | 12/6/2014 | 11:24:03 PM | |
| 10 | 9 | B14-02922-09 | 1.163 | 5.10 | 385.56 | 22.79 | 240.00 | 12/7/2014 | 3:35:04 AM | |
| 10 | 10 | B14-02922-10 | 1.150 | 4.94 | 398.88 | 23.27 | 240.00 | 12/7/2014 | 7:46:19 AM | |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-02922 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Initial_Mass_sample_g | Mass_Na2O2_added_g | Final_mass_electrolyzed_sample_NaOH_g | Mass_equivalent_NaOH_g | Final_Mass_Electrolyzed_sample_g | VolumeFactor_X | Enrichment_Factor_Y |
|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02922-01 | 500.510 | 2.000 | 17.550 | 2.052 | 15.498 | 0.031 | 25.329 |
| LSC-A-022 | ARS1-B14-02922-02 | 500.570 | 2.050 | 16.870 | 2.103 | 14.767 | 0.029 | 26.536 |
| LSC-A-022 | ARS1-B14-02922-03 | 502.940 | 2.000 | 15.070 | 2.052 | 13.018 | 0.026 | 30.090 |
| LSC-A-022 | ARS1-B14-02922-04 | 503.070 | 2.080 | 14.650 | 2.134 | 12.516 | 0.025 | 31.257 |
| LSC-A-022 | ARS1-B14-02922-05 | 500.510 | 2.050 | 16.450 | 2.103 | 14.347 | 0.029 | 27.279 |
| LSC-A-022 | ARS1-B14-02922-06 | 502.230 | 2.070 | 19.470 | 2.124 | 17.346 | 0.035 | 22.804 |
| LSC-A-022 | ARS1-B14-02922-07 | 500.650 | 2.000 | 19.730 | 2.052 | 17.678 | 0.035 | 22.325 |
| LSC-A-022 | ARS1-B14-02922-08 | 502.060 | 2.000 | | 2.052 | | | |
| LSC-A-022 | ARS1-B14-02922-09 | 500.850 | 2.080 | 17.390 | 2.134 | 15.256 | 0.030 | 25.732 |
| LSC-A-022 | ARS1-B14-02922-10 | 502.130 | 2.000 | 18.330 | 2.052 | 16.278 | 0.032 | 24.236 |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-02922 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Average_Sample_CPM | Bkg_CPM | tSIE | Detector_Eff_decimal | Aliquot | AliqUnits | Activity_reference_date | Start_Date_of_Count | Sample_Count_Duration_min |
|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02922-01 | 3.585 | 1.096 | 388.520 | 0.229 | 0.01004 | L | 1/3/2013 | 12/5/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02922-02 | 2.702 | 1.096 | 379.270 | 0.226 | 0.01010 | L | 1/3/2013 | 12/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02922-03 | 1.211 | 1.096 | 398.850 | 0.233 | 0.01000 | L | 12/5/2014 | 12/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02922-04 | 1.060 | 1.096 | 385.420 | 0.228 | 0.01017 | L | 10/31/2014 | 12/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02922-05 | 1.160 | 1.096 | 385.870 | 0.228 | 0.01004 | L | 10/30/2014 | 12/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02922-06 | 1.025 | 1.096 | 390.150 | 0.230 | 0.01003 | L | 10/30/2014 | 12/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02922-07 | 1.108 | 1.096 | 378.190 | 0.225 | 0.01026 | L | 10/30/2014 | 12/6/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02922-08 | | 1.096 | | | | L | | | |
| LSC-A-022 | ARS1-B14-02922-09 | 1.163 | 1.096 | 385.560 | 0.228 | 0.01024 | L | 10/30/2014 | 12/7/2014 | 240.000 |
| LSC-A-022 | ARS1-B14-02922-10 | 1.150 | 1.096 | 398.880 | 0.233 | 0.01003 | L | 10/30/2014 | 12/7/2014 | 240.000 |
| | | | | | | | | | | |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-02922 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | Total_Bkg_Count_Duration_min | DF | Sample_Activity_Conc | Standard_Counting_Uncertainty | CU_1 | CSU_1 | CU_1_96 | CSU_1_96 | MDC | DLC | ActivityReportUnits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02922-01 | 240.000 | 0.89751 | 21.461 | 1.204 | 1.204 | 3.437 | 2.360 | 6.736 | 2.808 | 1.355 | pCi |
| LSC-A-022 | ARS1-B14-02922-02 | 240.000 | 0.89751 | 13.325 | 1.044 | 1.044 | 2.255 | 2.046 | 4.419 | 2.702 | 1.304 | pCi |
| LSC-A-022 | ARS1-B14-02922-03 | 240.000 | 0.99985 | 0.740 | 0.631 | 0.631 | 0.641 | 1.236 | 1.255 | 2.096 | 1.012 | pCi |
| LSC-A-022 | ARS1-B14-02922-04 | 240.000 | 0.99447 | -0.225 | 0.593 | 0.593 | 0.594 | 1.162 | 1.164 | 2.037 | 0.983 | pCi |
| LSC-A-022 | ARS1-B14-02922-05 | 240.000 | 0.99432 | 0.464 | 0.703 | 0.703 | 0.707 | 1.379 | 1.385 | 2.363 | 1.141 | pCi |
| LSC-A-022 | ARS1-B14-02922-06 | 240.000 | 0.99432 | -0.613 | 0.811 | 0.811 | 0.816 | 1.590 | 1.600 | 2.811 | 1.357 | pCi |
| LSC-A-022 | ARS1-B14-02922-07 | 240.000 | 0.99416 | 0.105 | 0.841 | 0.841 | 0.842 | 1.649 | 1.649 | 2.860 | 1.380 | pCi |
| LSC-A-022 | ARS1-B14-02922-08 | 240.000 | | | | | | | | | | pCi |
| LSC-A-022 | ARS1-B14-02922-09 | 240.000 | 0.99416 | 0.506 | 0.732 | 0.732 | 0.736 | 1.435 | 1.442 | 2.458 | 1.186 | pCi |
| LSC-A-022 | ARS1-B14-02922-10 | 240.000 | 0.99416 | 0.433 | 0.775 | 0.775 | 0.778 | 1.519 | 1.524 | 2.609 | 1.259 | pCi |

| ARS-040 Calculation Results | |
|---|---|
| ARS1-B14-02922 | |
| ACF | 1 |
| UCF | 2.22 |
| Sys Error | 0.15 |

| AnalysisCode | ABatchSampleID | AliquotReportUnits | UserID | ModDate |
|---|---|---|---|---|
| LSC-A-022 | ARS1-B14-02922-01 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-02 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-03 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-04 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-05 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-06 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-07 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-08 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-09 | L | AMRAD\JBYRD | 12/8/2014 |
| LSC-A-022 | ARS1-B14-02922-10 | L | AMRAD\JBYRD | 12/8/2014 |
| | | | | |

**ARS Batch Number:** ARS1-B14 - 02922

| Enter these Values for LCS | | | |
|---|---|---|---|
| | Current ACT | 5.3033 | Standards Report |
| | NetWt | 5.0790 | LCS Report |
| | Aliquot | 0.5005 | Procedural Data Report |

| Enter these Values for LCSD | | | |
|---|---|---|---|
| | Current ACT | 5.3033 | Standards Report |
| | NetWt | 5.0410 | LCS Report |
| | Aliquot | 0.5006 | Procedural Data Report |

## Expected Value Calculations

**ARS Batch Number:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **LCS** | **CALCULATED EXPECTED VALUE** | = | 24.2415 | | | |
| | | | **Range** | 18.1811 | - | 30.3018 |
| **LCSD** | **CALCULATED EXPECTED VALUE** | = | 24.0572 | | | |
| | | | **Range** | 18.0429 | - | 30.0715 |

# Technical Notes



| | |
|---|---|
| Batch | ARS1-B14-02922 |
| Analysis Code | LSC-A-022 |
| Procedure No | ARS-040 |
| Matrix | AQ |

| # | Date | Dept | Batch Technical Notes | User ID |
|---|---|---|---|---|
| 1 | 12/08/14 12:12 | CHEMISTRY | Sample B14-02922-08 went to dryness for electrolysis could be completed so the sample was removed from the batch and will be reran. | AMRAD\JBYRD |

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technician Initials |
|---|---|---|---|---|---|
| 11-22-14 | 14:00 | B14-02720-21 | B14-02720 | 2103 | JB |
| ↓ | ↓ | ↓ -22 | ↓ | ↓ | JB |
| 12-2-14 | 17:40 | B14 03152-04 | B14-03152 | 1920 | JB |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -09 | ↓ | ↓ | JB |
| 12-5-14 | 16:22 | SNC16 | QA | QA | JB |
| ↓ | ↓ | Background | B14-02922 | 1757 | JB |
| ↓ | ↓ | B14-02922-01 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -02 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -03 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -04 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -09 | ↓ | ↓ | JB |
| ↓ | ↓ | ↓ -10 | ↓ | ↓ | JB |
| | | | | | |

Reviewed By: SDR Date: 12-8-14
Initials

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Low Level Tritium by Low Level Liquid Scintillation Counting

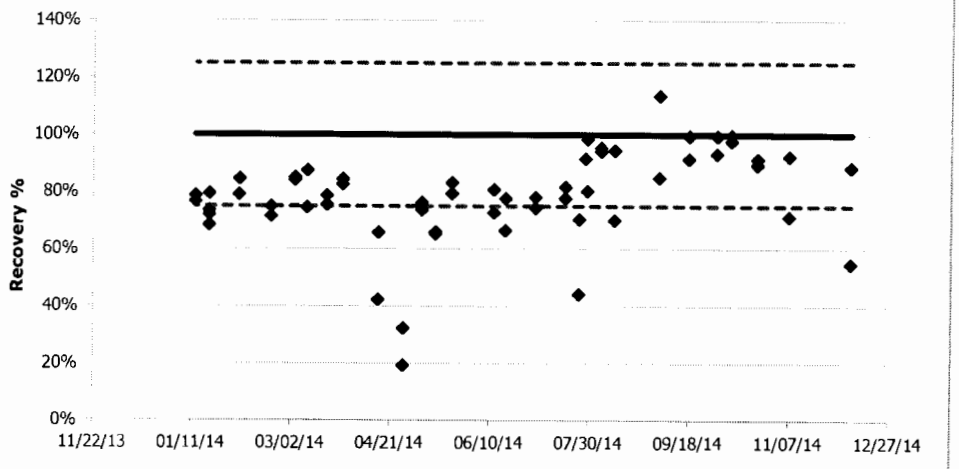
# Control Charts

American Radiation Services
Baton Rouge Laboratory

# QC Chart

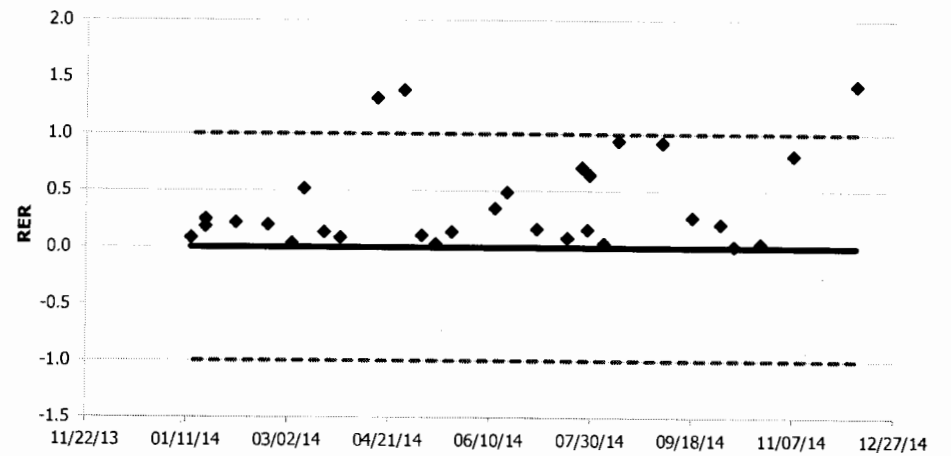


## LLH-3 LCS



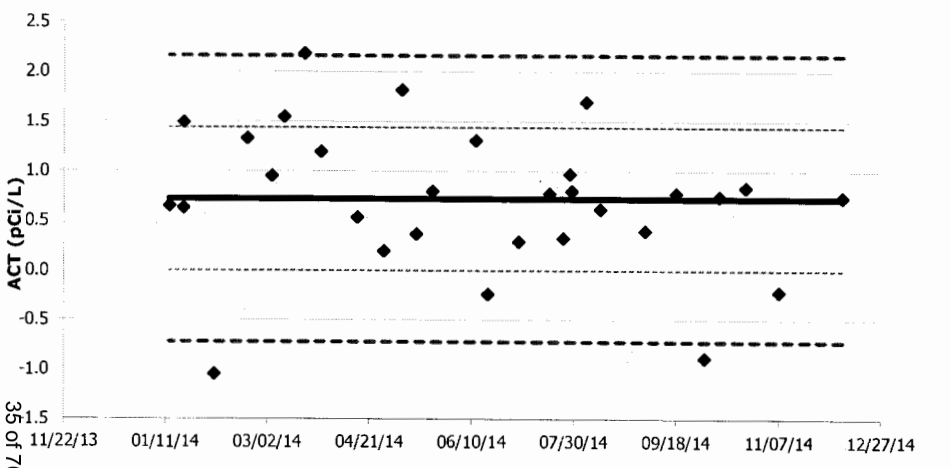

| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.7875 | 0.1627 | 30 | 1.2500 | 0.7500 |

## LLH-3 RER



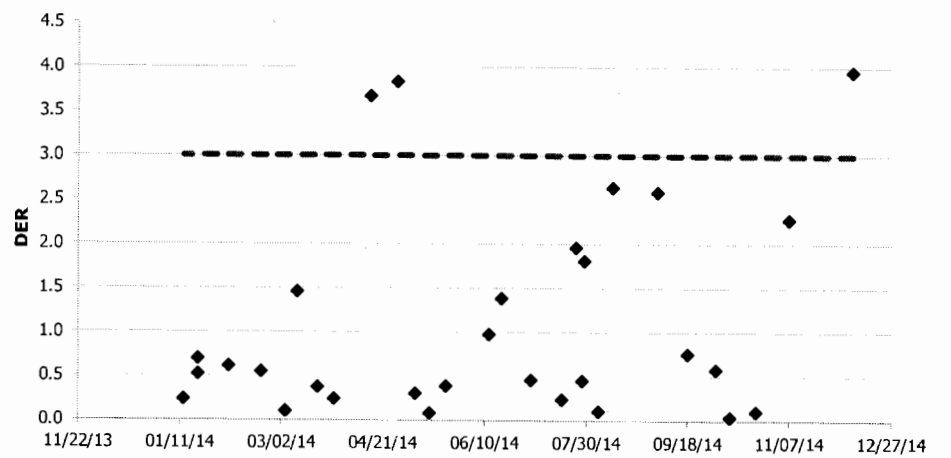

| n | UCL | LCL |
|---|---|---|
| 30 | 1.0000 | -1.0000 |

## LLH-3 Blank




| Average | STDEV | n | UCL | LCL |
|---|---|---|---|---|
| 0.7200 | 0.7212 | 30 | 2.1623 | -0.7223 |

## LLH-3 DER



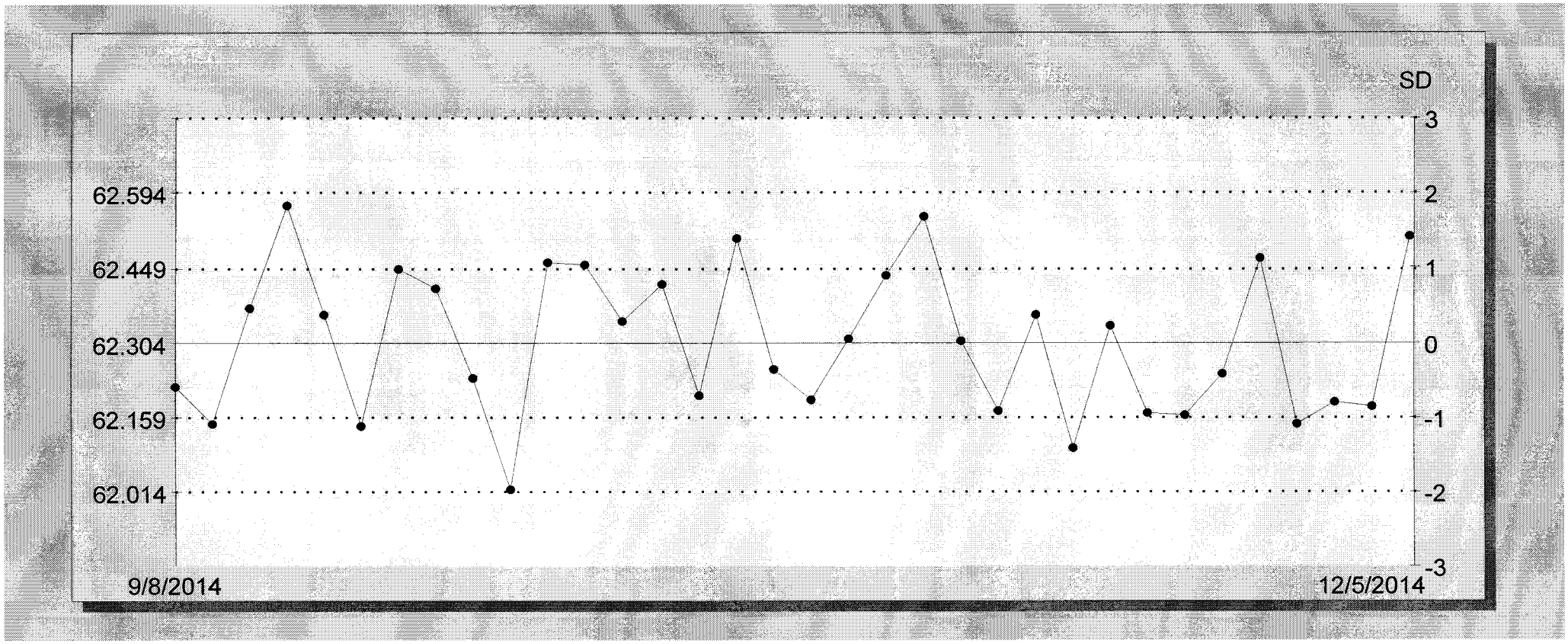

| n | UCL |
|---|---|
| 30 | 3.0000 |

3H Efficiency
Total # pts : 5946
Valid # pts : 34
Mean : 62.30
SD : 0.14

| Date | Value | Valid Pt |
|---|---|---|
| Sep 08, 2014 | 62.22 | X |
| Sep 12, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.37 | X |
| Sep 14, 2014 | 62.57 | X |
| Sep 14, 2014 | 62.36 | X |
| Sep 14, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.45 | X |
| Sep 17, 2014 | 62.41 | X |
| Sep 18, 2014 | 62.23 | X |
| Sep 26, 2014 | 62.02 | X |
| Sep 28, 2014 | 62.46 | X |
| Oct 01, 2014 | 62.45 | X |
| Oct 02, 2014 | 62.34 | X |
| Oct 05, 2014 | 62.42 | X |
| Oct 07, 2014 | 62.20 | X |
| Oct 13, 2014 | 62.50 | X |
| Oct 21, 2014 | 62.25 | X |
| Oct 24, 2014 | 62.19 | X |
| Oct 27, 2014 | 62.31 | X |
| Oct 28, 2014 | 62.43 | X |
| Oct 29, 2014 | 62.55 | X |
| Oct 29, 2014 | 62.30 | X |
| Nov 03, 2014 | 62.17 | X |
| Nov 05, 2014 | 62.36 | X |
| Nov 05, 2014 | 62.10 | X |
| Nov 07, 2014 | 62.34 | X |
| Nov 12, 2014 | 62.17 | X |
| Nov 15, 2014 | 62.16 | X |
| Nov 18, 2014 | 62.24 | X |
| Nov 23, 2014 | 62.47 | X |
| Nov 27, 2014 | 62.14 | X |
| Dec 01, 2014 | 62.19 | X |
| Dec 02, 2014 | 62.18 | X |
| Dec 05, 2014 | 62.51 | X |

3H Efficiency

| | |
|---|---|
| Total # pts | : 5946 |
| Valid # pts | : 34 |
| Mean | : 62.30 |
| SD | : 0.14 |

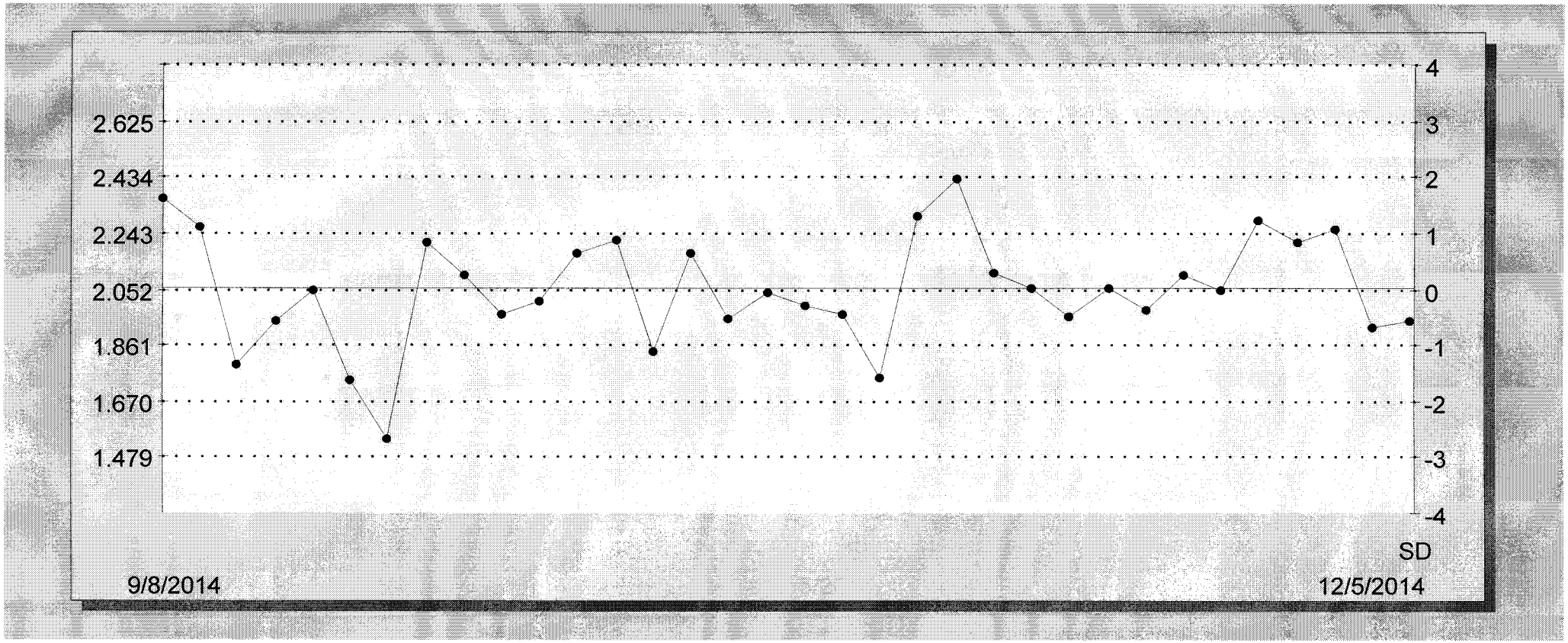


3H Background
Total # pts : 5871
Valid # pts : 34
Mean : 2.05
SD : 0.19

| Date | Value | Valid Pt |
|---|---|---|
| Sep 08, 2014 | 2.36 | X |
| Sep 12, 2014 | 2.26 | X |
| Sep 14, 2014 | 1.79 | X |
| Sep 14, 2014 | 1.95 | X |
| Sep 14, 2014 | 2.05 | X |
| Sep 14, 2014 | 1.74 | X |
| Sep 14, 2014 | 1.54 | X |
| Sep 17, 2014 | 2.21 | X |
| Sep 18, 2014 | 2.10 | X |
| Sep 26, 2014 | 1.97 | X |
| Sep 28, 2014 | 2.01 | X |
| Oct 01, 2014 | 2.17 | X |
| Oct 02, 2014 | 2.22 | X |
| Oct 05, 2014 | 1.84 | X |
| Oct 07, 2014 | 2.17 | X |
| Oct 13, 2014 | 1.95 | X |
| Oct 21, 2014 | 2.04 | X |
| Oct 24, 2014 | 2.00 | X |
| Oct 27, 2014 | 1.97 | X |
| Oct 28, 2014 | 1.75 | X |
| Oct 29, 2014 | 2.30 | X |
| Oct 29, 2014 | 2.43 | X |
| Nov 03, 2014 | 2.11 | X |
| Nov 05, 2014 | 2.06 | X |
| Nov 05, 2014 | 1.96 | X |
| Nov 07, 2014 | 2.06 | X |
| Nov 12, 2014 | 1.98 | X |
| Nov 15, 2014 | 2.10 | X |
| Nov 18, 2014 | 2.05 | X |
| Nov 23, 2014 | 2.29 | X |
| Nov 27, 2014 | 2.21 | X |
| Dec 01, 2014 | 2.25 | X |
| Dec 02, 2014 | 1.92 | X |
| Dec 05, 2014 | 1.95 | X |

3H Background

| | |
|---|---|
| Total # pts | : 5871 |
| Valid # pts | : 34 |
| Mean | : 2.05 |
| SD | : 0.19 |



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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium- Screening by Low Level Liquid Scintillation Counting

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting Samples

***Procedures:*** **ARS-060** **ARS-040** *Section 14.1 Tritium Screen in Clean Water without Distillation*

***ARS File ID Numbers:*** ARS1-14-03066; 3067; 3068
***ARS Batch ID:*** ARS1-B14-02886

| | Sample ID: | COUNT TIME | CPMA | Background CPMA | Eff Nucl In A | Aliquot (grams) | ACTIVITY | units | MDA | Sample Must be analyzed as LSC-A-001 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | B14-02886-04 | 120 | 1.219 | 1.141 | 23.15 | 10.00 | 15.177 | pCi/L | 112.6821 | NO |
| 2 | B14-02886-05 | 120 | 1.327 | 1.141 | 22.94 | 10.00 | 36.523 | pCi/L | 113.7136 | NO |
| 3 | B14-02886-06 | 120 | 1.334 | 1.141 | 23.52 | 10.00 | 36.963 | pCi/L | 110.9095 | NO |
| 4 | B14-02886-07 | 120 | 1.274 | 1.141 | 23.48 | 10.00 | 25.515 | pCi/L | 111.0984 | NO |
| 5 | B14-02886-08 | 120 | 1.259 | 1.141 | 23.15 | 10.00 | 22.960 | pCi/L | 112.6821 | NO |
| 6 | B14-02886-09 | 120 | 1.210 | 1.141 | 22.96 | 10.00 | 13.537 | pCi/L | 113.6146 | NO |
| 7 | B14-02886-10 | 120 | 1.136 | 1.141 | 23.06 | 10.00 | -0.977 | pCi/L | 113.1219 | NO |
| 8 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 9 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 10 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 11 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 12 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 13 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 14 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 15 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 16 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 17 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 18 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 19 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 20 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 21 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 22 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |
| 23 | | | | | | | #DIV/0! | pCi/L | #DIV/0! | #DIV/0! |

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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

# Tritium-Screening by Low Level Liquid Scintillation Counting

# Laboratory Records

# Analysis Batch Report



**Analysis Batch ID** **ARS1-B14-02886**

| Method | ARS-054 | Analysis | LSC-A-021 | Matrix | AQ |
|---|---|---|---|---|---|
| Description | Low Level Tritium Screening | | | | |

| ABatch Sample ID | Type | Blind Iso1 | Blind Iso2 | Blind Iso3 | SDG | FR | Run | Client ID | Isotope Group | Lab Deadline |
|---|---|---|---|---|---|---|---|---|---|---|
| ARS1-B14-02886-01 | LCS | | | | | | | | | |
| ARS1-B14-02886-02 | LCSD | | | | | | | | | |
| ARS1-B14-02886-03 | MBL | | | | | | | | | |
| ARS1-B14-02886-04 | TRG | | | | **ARS1-14-03066** | 001 | 1 | CAPA-14-87182 | STD | 12/01/14 |
| ARS1-B14-02886-05 | TRG | | | | **ARS1-14-03066** | 002 | 1 | CAPA-14-87204 | STD | 12/01/14 |
| ARS1-B14-02886-06 | TRG | | | | **ARS1-14-03066** | 003 | 1 | CAPA-14-87154 | STD | 12/01/14 |
| ARS1-B14-02886-07 | TRG | | | | **ARS1-14-03066** | 004 | 1 | CAPA-14-87205 | STD | 12/01/14 |
| ARS1-B14-02886-08 | TRG | | | | **ARS1-14-03067** | 001 | 1 | CAWR-14-89237 | STD | 12/01/14 |
| ARS1-B14-02886-09 | TRG | | | | **ARS1-14-03068** | 001 | 1 | CAWR-14-89229 | STD | 12/01/14 |
| ARS1-B14-02886-10 | TRG | | | | **ARS1-14-03068** | 002 | 1 | CAWR-14-89222 | STD | 12/01/14 |

# ARS-054



| ID_31001_054 | ABatch | ABatchSampleID | ClientID | Aliquot1 | AliquotUnits1 | IC_ID1 | Aliquot2 | AliquotUnits2 | IC_ID2 | UserID | ModDate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14279 | ARS1-B14-02886 | ARS1-B14-02886-01 | | 1 | L | | | | | AMRAD\JBYRD | 11/12/2014 10:37:39 |
| 14280 | ARS1-B14-02886 | ARS1-B14-02886-02 | | 1 | L | | | | | AMRAD\JBYRD | 11/12/2014 10:37:39 |
| 14281 | ARS1-B14-02886 | ARS1-B14-02886-03 | | 1 | L | | | | | AMRAD\JBYRD | 11/12/2014 10:37:39 |
| 14282 | ARS1-B14-02886 | ARS1-B14-02886-04 | CAPA-14-87182 | 10 | L | 180963 | | | | AMRAD\JBYRD | 11/12/2014 10:37:40 |
| 14283 | ARS1-B14-02886 | ARS1-B14-02886-05 | CAPA-14-87204 | 10 | L | 180964 | | | | AMRAD\JBYRD | 11/12/2014 10:37:40 |
| 14284 | ARS1-B14-02886 | ARS1-B14-02886-06 | CAPA-14-87154 | 10 | L | 180965 | | | | AMRAD\JBYRD | 11/12/2014 10:37:40 |
| 14285 | ARS1-B14-02886 | ARS1-B14-02886-07 | CAPA-14-87205 | 10 | L | 180966 | | | | AMRAD\JBYRD | 11/12/2014 10:37:41 |
| 14286 | ARS1-B14-02886 | ARS1-B14-02886-08 | CAWR-14-89237 | 10 | L | 180967 | | | | AMRAD\JBYRD | 11/12/2014 10:37:42 |
| 14287 | ARS1-B14-02886 | ARS1-B14-02886-09 | CAWR-14-89229 | 10 | L | 180968 | | | | AMRAD\JBYRD | 11/12/2014 10:37:42 |
| 14288 | ARS1-B14-02886 | ARS1-B14-02886-10 | CAWR-14-89222 | 10 | L | 180969 | | | | AMRAD\JBYRD | 11/12/2014 10:37:42 |

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141112_1138
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141112_1138\20141112_1138.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141112_1138\LLH3.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3_3\20141112_1138\LLH3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3_3.lsa

Count Conditions-

Nuclide: Low Level H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3 10mL
Count Time (min): 120.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

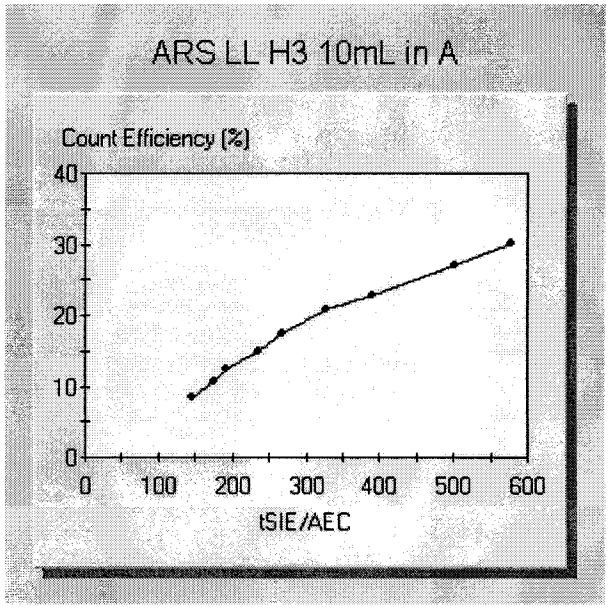
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 08/23/2014
Date Modified:
ARS LL H3 10mL in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 579.14 | 30.08 |
| 502.50 | 27.05 |
| 390.30 | 22.96 |
| 328.76 | 20.79 |
| 269.84 | 17.56 |
| 235.00 | 14.99 |
| 193.53 | 12.42 |
| 175.30 | 10.70 |
| 145.76 | 8.35 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 1 | BACKGROUND | 1.141 | 5.17 | 365.37 | 22.08 | 120.00 | 11/12/2014 | 11:47:45 AM | |
| 10 | 2 | B14-02886-04 | 1.219 | 5.26 | 395.69 | 23.15 | 120.00 | 11/12/2014 | 1:57:39 PM | |
| 10 | 3 | B14-02886-05 | 1.327 | 5.78 | 389.96 | 22.94 | 120.00 | 11/12/2014 | 4:07:34 PM | |
| 10 | 4 | B14-02886-06 | 1.334 | 5.67 | 405.70 | 23.52 | 120.00 | 11/12/2014 | 6:17:30 PM | |
| 10 | 5 | B14-02886-07 | 1.274 | 5.42 | 404.59 | 23.48 | 120.00 | 11/12/2014 | 8:27:25 PM | |
| 10 | 6 | B14-02886-08 | 1.259 | 5.44 | 395.72 | 23.15 | 120.00 | 11/12/2014 | 10:37:20 PM | |
| 10 | 7 | B14-02886-09 | 1.210 | 5.27 | 390.41 | 22.96 | 120.00 | 11/13/2014 | 12:47:14 AM | |
| 10 | 8 | B14-02886-10 | 1.136 | 4.92 | 393.20 | 23.06 | 120.00 | 11/13/2014 | 2:57:09 AM | |

# Beta Liquid Scintillation Counter Log Book

| Date | Time | ARS Sample I.D. Number | Batch Number | Liquid Scintillation File Number | Technici Initials | Date |
|---|---|---|---|---|---|---|
| 11-5-14 | 17:18 | B14-02562-02 | B14-02562 | 2148 | JB | -12-14 |
| ↓ | ↓ | ↓ -03 | ↓ | ↓ | JB | ↓ |
| ↓ | ↓ | ↓ -04 | ↓ | ↓ | JB | ↓ |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB | ↓ |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | JB | |
| 11-12-14 | 9:56 | SNC 16 | QA | QA | JB | |
| ↓ | ↓ | Background | B14-02886 | 1138 | JB | |
| ↓ | ↓ | B14-02886 -04 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -06 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -07 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -09 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -10 | ↓ | ↓ | JB | |
| ↓ | | Background | B14-02653 | ~~1138~~ JB 11-13-14 | JB | |
| ↓ | ↓ | B14-02653-02 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -04 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -05 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -08 | ↓ | ↓ | JB | |
| ↓ | ↓ | ↓ -01 | ↓ | ↓ | JB | |



Reviewed By: [illegible] Initials Date: 12-8-14

## *Low Level Tritium pH Checks*

| SDG# | Fraction | pH | Date | Analyst |
|---|---|---|---|---|
| ARS1-14-03066 | 001 | 7 | 11-12-14 | JB |
| ↓ | 002 | 7 | ↓ | JB |
| ↓ | 003 | 7 | ↓ | JB |
| ↓ | 004 | 7 | ↓ | JB |
| ARS1-14-03067 | 001 | 7 | ↓ | JB |
| ARS1-14-03068 | 001 | 7 | ↓ | JB |
| ↓ | 002 | 7 | ↓ | JB |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | N/A | | | |
| | | | | |
| | | JB | | |
| | | | | |
| | 11-12-14 | | | |
| | | | | |
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| | | | | |

*ARS-040-001.r0*

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# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

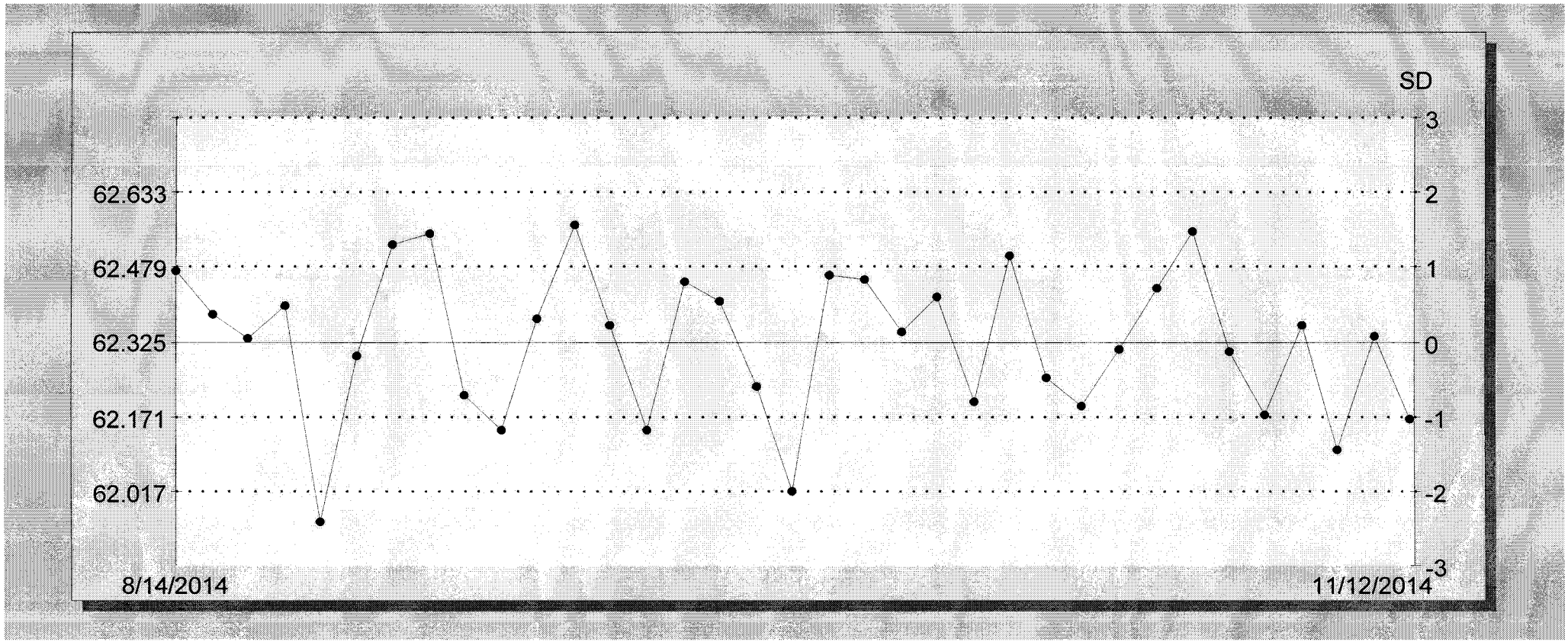
# Tritium-Screening by Low Level Liquid Scintillation Counting

# Control Charts

3H Efficiency
Total # pts : 5939
Valid # pts : 35
Mean : 62.32
SD : 0.15

| Date | Value | Valid Pt |
|---|---|---|
| Aug 14, 2014 | 62.47 | X |
| Aug 15, 2014 | 62.38 | X |
| Aug 19, 2014 | 62.33 | X |
| Aug 20, 2014 | 62.40 | X |
| Aug 22, 2014 | 61.95 | X |
| Aug 29, 2014 | 62.29 | X |
| Sep 04, 2014 | 62.53 | X |
| Sep 05, 2014 | 62.55 | X |
| Sep 08, 2014 | 62.22 | X |
| Sep 12, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.37 | X |
| Sep 14, 2014 | 62.57 | X |
| Sep 14, 2014 | 62.36 | X |
| Sep 14, 2014 | 62.14 | X |
| Sep 14, 2014 | 62.45 | X |
| Sep 17, 2014 | 62.41 | X |
| Sep 18, 2014 | 62.23 | X |
| Sep 26, 2014 | 62.02 | X |
| Sep 28, 2014 | 62.46 | X |
| Oct 01, 2014 | 62.45 | X |
| Oct 02, 2014 | 62.34 | X |
| Oct 05, 2014 | 62.42 | X |
| Oct 07, 2014 | 62.20 | X |
| Oct 13, 2014 | 62.50 | X |
| Oct 21, 2014 | 62.25 | X |
| Oct 24, 2014 | 62.19 | X |
| Oct 27, 2014 | 62.31 | X |
| Oct 28, 2014 | 62.43 | X |
| Oct 29, 2014 | 62.55 | X |
| Oct 29, 2014 | 62.30 | X |
| Nov 03, 2014 | 62.17 | X |
| Nov 05, 2014 | 62.36 | X |
| Nov 05, 2014 | 62.10 | X |
| Nov 07, 2014 | 62.34 | X |
| Nov 12, 2014 | 62.17 | X |

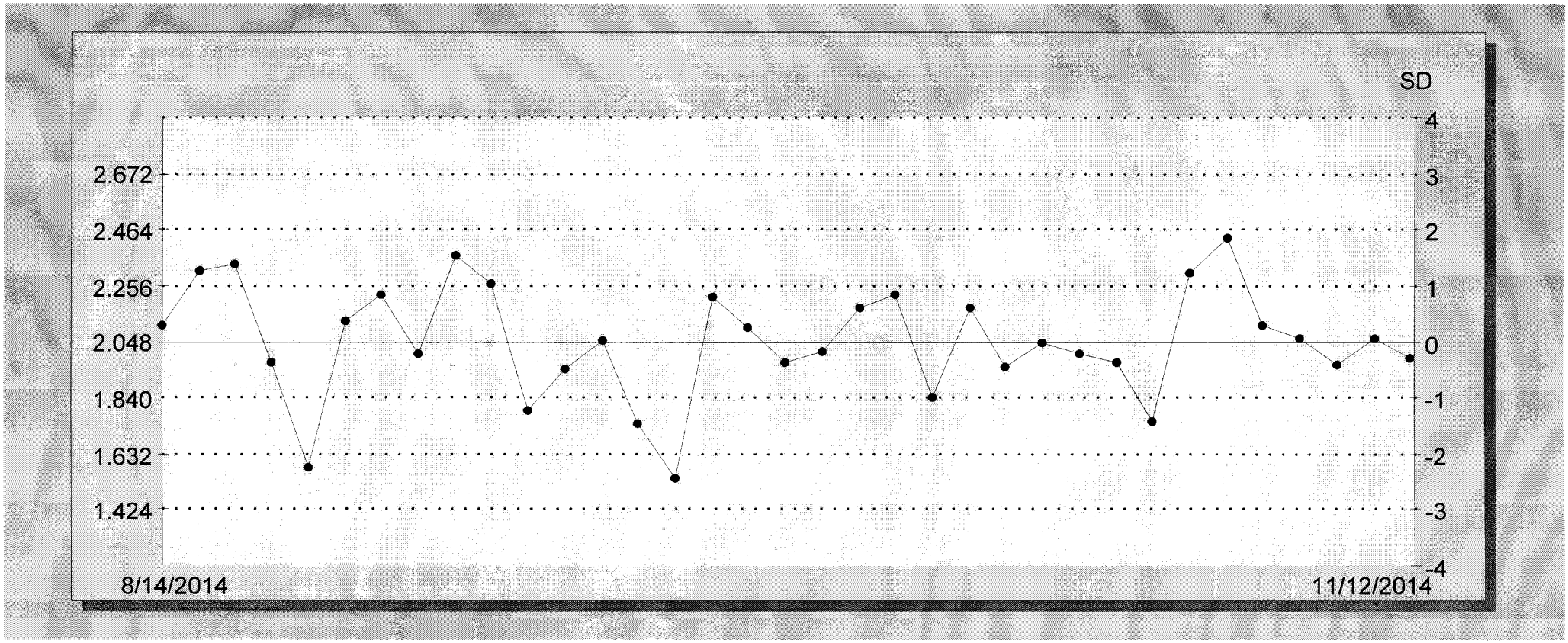
3H Efficiency
Total # pts : 5939
Valid # pts : 35
Mean : 62.32
SD : 0.15



3H Background
Total # pts : 5864
Valid # pts : 35
Mean : 2.05
SD : 0.21

| Date | Value | Valid Pt |
|---|---|---|
| Aug 14, 2014 | 2.11 | X |
| Aug 15, 2014 | 2.31 | X |
| Aug 19, 2014 | 2.33 | X |
| Aug 20, 2014 | 1.97 | X |
| Aug 22, 2014 | 1.58 | X |
| Aug 29, 2014 | 2.13 | X |
| Sep 04, 2014 | 2.22 | X |
| Sep 05, 2014 | 2.00 | X |
| Sep 08, 2014 | 2.36 | X |
| Sep 12, 2014 | 2.26 | X |
| Sep 14, 2014 | 1.79 | X |
| Sep 14, 2014 | 1.95 | X |
| Sep 14, 2014 | 2.05 | X |
| Sep 14, 2014 | 1.74 | X |
| Sep 14, 2014 | 1.54 | X |
| Sep 17, 2014 | 2.21 | X |
| Sep 18, 2014 | 2.10 | X |
| Sep 26, 2014 | 1.97 | X |
| Sep 28, 2014 | 2.01 | X |
| Oct 01, 2014 | 2.17 | X |
| Oct 02, 2014 | 2.22 | X |
| Oct 05, 2014 | 1.84 | X |
| Oct 07, 2014 | 2.17 | X |
| Oct 13, 2014 | 1.95 | X |
| Oct 21, 2014 | 2.04 | X |
| Oct 24, 2014 | 2.00 | X |
| Oct 27, 2014 | 1.97 | X |
| Oct 28, 2014 | 1.75 | X |
| Oct 29, 2014 | 2.30 | X |
| Oct 29, 2014 | 2.43 | X |
| Nov 03, 2014 | 2.11 | X |
| Nov 05, 2014 | 2.06 | X |
| Nov 05, 2014 | 1.96 | X |
| Nov 07, 2014 | 2.06 | X |
| Nov 12, 2014 | 1.98 | X |

3H Background
Total # pts : 5864
Valid # pts : 35
Mean : 2.05
SD : 0.21



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# American Radiation Services Analytical Reports

for

# Los Alamos National Laboratory

## Low Level Liquid Scintillation Counting

# Calibration Information

ARS INTERNATIONAL

QUALITY CONTROL PROGRAM

AMERICAN RADIATION SERVICES
RADIOACTIVE REFERENCE SOLUTIONS

# ANNUAL ACTIVITY VERIFICATION

VERIFICATION DATE 1/7/2014 3:43 *date counted*
STANDARD REFERENCE # S-0289

| Principal Radionuclide | | Half Life, Years | | Half Life, Days |
|---|---|---|---|---|
| H-3 | *ENTER -->* | | *OR -->* | 4.4998E+03 |
| | | 1.232E+01 | | 4.4998E+03 |

Radionuclide H-3 Dilution Reference Date 1/3/2014 13:25

| | | | | |
|---|---|---|---|---|
| Dilution Activity | 2.66 | pCi per gram ===> dpm/g | 5.91 |
| Verif. Date Decay Corrected | 2.66 | pCi per gram ===> dpm/g | 5.90 |

*Minimum of 3 Required*

| Trial ID | Sample Counts | Count Time (min) | Detector | Efficiency | Bkg. (cpm) | Net Weight | Decay Corrected Activity Result (dpm/g) | Decay Corrected Activity Result (pCi/g) |
|---|---|---|---|---|---|---|---|---|
| S-0289-V1 | 21.75 | 1 | LSC | 0.3549 | 10.54 | 5.019 | 6.29 | 2.83 |
| S-0289-V2 | 20.53 | 1 | LSC | 0.3546 | 10.54 | 4.993 | 5.64 | 2.54 |
| S-0289-V3 | 20.60 | 1 | LSC | 0.3546 | 10.54 | 4.996 | 5.68 | 2.56 |
| S-0289-V4 | 21.00 | 1 | LSC | 0.3547 | 10.54 | 5.005 | 5.89 | 2.65 |
| S-0289-V5 | 21.18 | 1 | LSC | 0.3542 | 10.54 | 4.993 | 6.02 | 2.71 |

| | | | |
|---|---|---|---|
| | Average | 5.90 | 2.66 |
| | Two Sigma Uncertainty | 0.52 | 0.24 |
| *10% Max* *PASS* | Standard Deviation percent of known concentration | 4.51% | 4.51% |
| | Target Activity | 5.90 | 2.66 |
| *5% Max* *PASS* | % Diff | 0.00% | 0.00% |

**Verification Expiration Date:** January 7, 2015

Prepared & Counted By _____ Date: 1/7/2014 3:43

Verified & Approved By _____ Date: 1-8-14

QC Approval _____ Date: 1-8-14

**S-0289**
**H-3**
SL

| | |
|---|---|
| Manufactuer | NIST SRM 4927F |
| Sol Matrix | H2O |
| Ref No | NIST SRM 4927F |
| Tech | Unknown |
| Parent ID | S-0237 |

Verified 1/7/14
Expires 1/7/15

ARS INTERNATIONAL
RADIOACTIVE STANDARDS – BATON ROUGE LABORATORY

Assay Definition-

Assay Description:
H3 Normal Lvl

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\20140106_1733.results
RTF File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H3 Normal Lvl2\20140106_1733\H3 Results.csv
Assay File Name: C:\Packard\TriCarb\Assays\H3 Normal Lvl2.lsa

Count Conditions-

Nuclide: Standard H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: PE UG STD H3
Count Time (min): 120.00
Count Mode: Normal
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

| Regions | LL | UL | 2Sigma % Terminator |
|---|---|---|---|
| A | 2.0 | 18.6 | 0.50 |
| B | 0.0 | 2000.0 | 0.00 |
| C | 0.0 | 2000.0 | 0.00 |

Count Corrections-

Static Controller: On Luminescence Correction: n/a
Colored Samples: Off Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

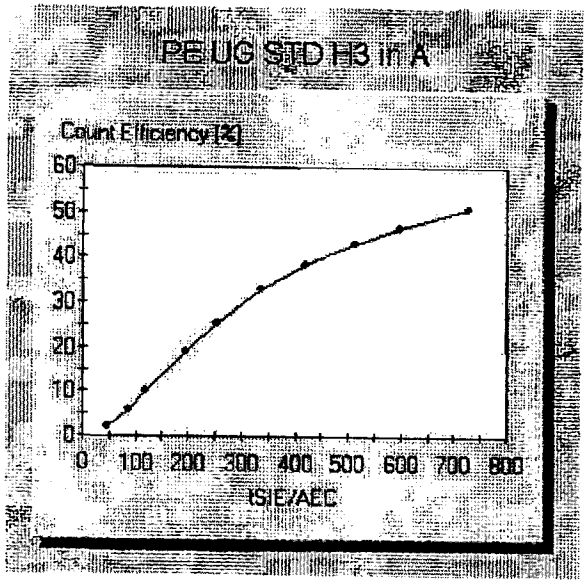
Half Life-

Half Life Correction: Off

| Regions | Half Life | Units | Reference Date | Reference Time |
|---|---|---|---|---|

A
B
C

Cycle 1 Results
Quench Curve Block Data




Date Acquired: 05/30/2013
Date Modified:
PE UG STD H3 in A

| tSIE/AEC | Count Efficiency (%) |
|---|---|
| 726.67 | 50.69 |
| 595.82 | 46.27 |
| 512.39 | 42.97 |
| 421.70 | 38.56 |
| 337.18 | 32.90 |
| 253.25 | 25.44 |
| 195.24 | 19.09 |
| 120.68 | 10.06 |
| 85.94 | 5.83 |
| 47.95 | 1.96 |

| P# | S# | SMPL_ID | CPMA | DPM1 | tSIE | Eff Nucl In A | Count Time | DATE | TIME | MESSAGES |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | BACKGROUND | 10.54 | 29.70 | 375.63 | 35.48 | 120.00 | 1/6/2014 | 5:34:01 PM | |
| 20 | 2 | S-0289-V1 | 21.75 | 61.30 | 375.79 | 35.49 | 120.00 | 1/6/2014 | 7:35:52 PM | |
| 20 | 3 | S-0289-V2 | 20.53 | 57.89 | 375.34 | 35.46 | 120.00 | 1/6/2014 | 9:37:44 PM | |
| 20 | 4 | S-0289-V3 | 20.60 | 58.09 | 375.37 | 35.46 | 120.00 | 1/6/2014 | 11:39:36 PM | |
| 20 | 5 | S-0289-V4 | 21.00 | 59.21 | 375.58 | 35.47 | 120.00 | 1/7/2014 | 1:41:31 AM | |
| 20 | 6 | S-0289-V5 | 21.18 | 59.80 | 374.77 | 35.42 | 120.00 | 1/7/2014 | 3:43:23 AM | |

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

| Planning | |
|---|---|
| Planning Comments | Create an H-3 LCS standard |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.67265112 |
| Appx vol ml of Parent Sol'n | 3.679273813 |
| Expected Addition for Analysis g | 5 |

| Standards Preparation / Dilution | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 01/03/2013 13:25 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | 3.9375 |
| DPM Xferred on 01/03/2013 13:25 | 11793.25195 |
| Diluent/matrix | DI H2O |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.9 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | 2000 |
| Final Dilution Density (g/mL) | 0.99607 |
| Final Dilution Measured Mass g | 1996.14 |
| Comments | H3 LCS standard. Dilution performed as stated above by BSteffens on 1/3/13. BJS 1/3/13 |
| Final Dilution dpm/g | 5.908028472 |
| Final Dil New Ref Date/Time | 01/03/2013 13:25 |

## Parent Standard Data

| | | | | | |
|---|---|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | | | |
| Parent Solution # | S-0237 | | | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.8000000 | | |
| Parent Reference Date | 03/22/2010 10:10 | | | | |
| Parent Certified Act | 3503.682716 | Certi Act/Vol Units | dpm | g | |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | | | |
| Parent Supplier | NIST SRM 4927F | | | | |
| Parent Date Recvd | 01/02/00 | | | | |
| Parent Received By | Unknown | | | | |
| Parent Cert Exp Date | | | | | |
| Parent Matrix | H2O | | | | |
| Certified dpm/g At Ref Date | 3503.682716 | | | | |
| Certified dpm/g on 01/03/2013 13:25 | 2995.111607 | | | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. BJS 3/22/10 | | | | |
| Parent Tech | Unknown | | | | |
| Is_Primary | FALSE | | | | |
| Is_LCS | TRUE | | | | |
| Is_Tracer | FALSE | | | | |
| Is_Calib | FALSE | | | | |

## H-3 Standard Verification

**Verifier's Name:** Brian Steffens **Date:** 1/6/2014

**Pipettor ID:** FJ40469
**Pipettor ID:** Auto-pipettor
**Pipettor ID:** na
**Standard ID:** S-0289
**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard |
|---|---|
| **S-0289-V1** | 5.019 g |
| **S-0289-V2** | 4.993 g |
| **S-0289-V3** | 4.996 g |
| **S-0289-V4** | 5.005 g |
| **S-0289-V5** | 4.993 g |
| | |
| | |
| | |
| | |
| | |

**Balance ID:** H1331122173560P

**H-3 Standard Verification**

**Verifier's Name:** Brian Steffens **Date:** 1-6-14

**Pipettor ID:** FJ40469

**Pipettor ID:** Auto-pipettor

**Pipettor ID:** na

**Standard ID:** S-0289

**Standard ID:** N/A

Standards brought up to ~5g with distilled dead water.
Standards made in glass vials.

15mL of Ultima Gold added to standard

| | Weight of Standard | |
|---|---|---|
| S-0289-V1 | 5.019 | g |
| S-0289-V2 | 4.993 | g |
| S-0289-V3 | 4.996 | g |
| S-0289-V4 | 5.005 | g |
| S-0289-V5 | 4.993 | g |
| | | |
| | | |
| | | |
| | | |
| | | |

**Balance ID:** H1331122173560P

# STD ID: S-0289

ARS INTERNATIONAL

## Add/Edit *Secondary Stds*

### Planning

| | |
|---|---|
| Planning Comments | |
| Target dpm/g (on dil. date) | 5.5 |
| Target Final volume mL | 2000 |
| Appx mass g of Parent Sol'n | 3.884999595 |
| Appx vol ml of Parent Sol'n | 3.892005204 |
| Expected Addition for Analysis g | |

### Standards Preparation / Dilution

| | |
|---|---|
| Secondary Solution # | S-0289 |
| Dilution Date (New Ref Date) | 1-3-13 1325 |
| Ampoule, Empty (g) | |
| Ampoule /Solution Gross (g) | |
| Net Wt Removed (g) | |
| Transfer Container, empty (g) | 1.8639 |
| Container Plus Solution (g) | 5.8014 |
| Net Wt Transferred (g) | |
| DPM Xferred on 01/03/2014 11:01 | |
| Diluent/matrix | |
| Diluent Density Cont, empty (g) | |
| Test Mass of 5 ml of Diluent (g) | |
| Diluent Density Test - (g/mL) | |
| Dilution Empty Container Mass (g) | 416.90 |
| Dilution Full Cont g (if measured) | 2413.04 |
| Dilution Final Volume ml (if measured) | |
| Final Dilution Density (g/mL) | |
| Final Dilution Measured Mass g | |
| Comments | |
| Final Dilution dpm/g | |
| Final Dil New Ref Date/Time | 01/03/2014 11:01 |

## Parent Standard Data

| | | | | |
|---|---|---|---|---|
| Parent Solution Reference # | NIST SRM 4927F | | | |
| Parent Solution # | S-0237 | | | |
| Parent Principal Radionuclide | H-3 | Half Life (Days) | 4499.8000000 | |
| Parent Reference Date | 03/22/2010 10:10 | | | |
| Parent Certified Act | 3503.682716 | Certl Act/Vol Units | dpm | g |
| Parent Cert Act Uncert 1 Sigma | 0.0036 | | | |
| Parent Sp. Gravity G/Ml | 0.9982 | | | |
| Parent Supplier | NIST SRM 4927F | | | |
| Parent Date Recvd | 01/02/00 | | | |
| Parent Received By | Unknown | | | |
| Parent Cert Exp Date | | | | |
| Parent Matrix | H2O | | | |
| Certified dpm/g At Ref Date | 3503.682716 | | | |
| Certified dpm/g on 01/03/2014 11:01 | 2831.403127 | | | |
| Parent Comments | Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. BJS 3/22/10 | | | |
| Parent Tech | Unknown | | | |
| Is_Primary | FALSE | | | |
| Is_LCS | TRUE | | | |
| Is_Tracer | FALSE | | | |
| Is_Calib | FALSE | | | |

INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# American Radiation Services Analytical Reports

## for

# Los Alamos National Laboratory

# Folder Duplicate

# Report Compilation Checklist

ARS SDG: 14-03068 Client Name: LANL Sample Matrix: AQ

| LEVEL 1 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 1) Cover Page Complete and Accurate (see ARS-059)? | Yes No N/A | |
| 2) Technical Review Checklist(s) Complete and Accurate? | Yes No N/A | |
| 3) Case Narrative Complete and Accurate (see ARS-059)? | Yes No N/A | |
| 4) Form 1s Present for all Samples and Tests? | Yes No N/A | |
| 5) Client Specific Components are Present and Complete? | Yes No N/A | |

| LEVEL 2 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 6) Batch Quality Control Report is Present and Accurate? | Yes No N/A | |
| 7) DQO Report is Present and Accurate? | Yes No N/A | |
| 8) Client Specific Batch QC Components are Present and Complete? | Yes No N/A | |

| LEVEL 3 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 9) Efficiencies are Present? | Yes No N/A | |
| 10) Calibrations are Present? | Yes No N/A | |
| 11) Backgrounds are Present? | Yes No N/A | |
| 12) Spectrum Analysis is Present? | Yes No N/A | |
| 13) Spectral Plots are Present? | Yes No N/A | |
| 14) Plateaus are Present? | Yes No N/A | |
| 15) Control Charts are Present? | Yes No N/A | |
| 16) Other: | Yes No N/A | |

| LEVEL 4 COMPONENTS | 1st Reviewer | |
|---|---|---|
| 17) Preparation Raw Data Present and Complete? | Yes No N/A | |
| 18) Instrument Raw Data Present and Complete? | Yes No N/A | |
| 19) Calibration Certificates Present? | Yes No N/A | |
| 20) Copies of Log Book Pages Present? | Yes No N/A | |
| 21) Sample Receiving Documentation Present? | Yes No N/A | |
| 22) LIMS Reports Present? | Yes No N/A | |
| 23) Applicable Correspondence Present? | Yes No N/A | |
| 24) Other: | Yes No N/A | |

Report Generator Signature 12-9-14 Date

Management Review Signature 12-9-14 Date

ARS-059-008
Revision: 1
Revision Date: 092214

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-03068

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

**ARS A. Batch ID(s):** **Batch A:** B14-03066 **Batch B:** NA **Batch C:** NA

**Test Method(s):** LSC-A-022 NA NA

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| 1) 100% of Manual Transcriptions Verified? | Yes No N/A | Yes No N/A |
| 2) 100% of Manual Calculations Verified? | Yes No N/A | Yes No N/A |
| 3) Blank Composition/Configuration Matches Calibration? | Yes No N/A | Yes No N/A |
| 4) Deviations from procedure are documented and verified? | Yes No N/A | Yes No N/A |
| 5) Appropriate Cocktail Selected? | Yes No N/A | Yes No N/A |

6) **Sample Prep Anomaly?** ☑ **No** ☐ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

Chemist Signature 12-5-14 Date Verifier Review Signature 12-5-14 Date

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| 1) Calibrations Valid and Current? | Yes No N/A | Yes No N/A |
| 2) Backgrounds Valid and Current? | Yes No N/A | Yes No N/A |
| 3) Source Checks Completed and Acceptable? | Yes No N/A | Yes No N/A |

QA Officer Signature 12-9-14 Date

| | Analyst Review | Technicial Review |
|---|---|---|
| 4) Background Checks Complete and Acceptable? | Yes No N/A | Yes No N/A |
| 5) 100% of Manually Entered Parameters Verified Accurate? | Yes No N/A | Yes No N/A |
| 6) Appropriate QC samples initiated at required frequency? | Yes No N/A | Yes No N/A |
| 6) **Test/Sample Specific Parameters** (See ARS-059 for details) | | |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

7) **Analysis Anomaly?** ☑ **No** ☐ **Yes** (See Comments) **NCR #** (If initiated): _____

Analyst Signature 12-8-14 Date Technicial Reviewer Signature 12-8-14 Date

ARS INTERNATIONAL

Batch A: B14-03066

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | QA Officer Review |
|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes ~~No~~ N/A | Yes (No) N/A |
| 2) RDL Criteria are Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 3) Method Blank Criterion Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 4) LCS/LCD Criteria Met? | ~~Yes~~ No N/A | (Yes) No N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | Yes ~~No~~ N/A | Yes (No) N/A |
| 6) MS/MSD Criteria Met? | Yes No ~~N/A~~ | Yes No (N/A) |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

SOL 12-9-14
Project Manager Signature Date

James D. Lu 12-9-14
QA Officer Signature Date

## GENERAL COMMENTS

# LSC
# Technical Review Checklist

**ARS SDG** ARS1-14-03068

**Sample Matrix:** AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

**Required QC Samples** (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

**ARS A. Batch ID(s):** **Batch A:** B14-02886 **Batch B:** NA **Batch C:** NA

**Test Method(s):** LSC-A-021 NA NA

## A. RADIOCHEMICAL PREPARATION REVIEW

| | Chemist Review | Verifier Review |
|---|---|---|
| 1) 100% of Manual Transcriptions Verified? | Yes No N/A | Yes No N/A |
| 2) 100% of Manual Calculations Verified? | Yes No N/A | Yes No N/A |
| 3) Blank Composition/Configuration Matches Calibration? | Yes No N/A | Yes No N/A |
| 4) Deviations from procedure are documented and verified? | Yes No N/A | Yes No N/A |
| 5) Appropriate Cocktail Selected? | Yes No N/A | Yes No N/A |

6) Sample Prep Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

Chemist Signature _____ Date 11-12-14 Verifier Review Signature _____ Date 11-12-14

## B. ANALYSIS REVIEW

| | Analyst Review | QA Officer Review |
|---|---|---|
| 1) Calibrations Valid and Current? | Yes No N/A | Yes No N/A |
| 2) Backgrounds Valid and Current? | Yes No N/A | Yes No N/A |
| 3) Source Checks Completed and Acceptable? | Yes No N/A | Yes No N/A |

QA Officer Signature _____ Date 12-9-14

| | Analyst Review | Technicial Review |
|---|---|---|
| 4) Background Checks Complete and Acceptable? | Yes No N/A | Yes No N/A |
| 5) 100% of Manually Entered Parameters Verified Accurate? | Yes No N/A | Yes No N/A |
| 6) Appropriate QC samples initiated at required frequency? | Yes No N/A | Yes No N/A |
| 6) Test/Sample Specific Parameters (See ARS-059 for details) | | NA |
| a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable? | Yes No N/A | Yes No N/A |
| b) Spectra show no Evidence of Interferences? | Yes No N/A | Yes No N/A |
| c) Sample Quench for All Samples within Range of Quench Curve? | Yes No N/A | Yes No N/A |

7) Analysis Anomaly? ☑ No ☐ Yes (See Comments) NCR # (If initiated): _____

Analyst Signature _____ Date 11-13-14 Technicial Reviewer Signature NA Date

Batch A: B14-02886

# LSC
# Technical Review Checklist

## C. BATCH QC VALIDATION

| | Proj. Mgr. Review | | | QA Officer Review | | |
|---|---|---|---|---|---|---|
| 1) Activity + 3xCSU a Negative Number? | Yes | No | N/A | Yes | No | N/A |
| 2) RDL Criteria are Met? | Yes | No | N/A | Yes | No | N/A |
| 3) Method Blank Criterion Met? | Yes | No | N/A | NA | No | N/A |
| 4) LCS/LCD Criteria Met? | Yes | No | N/A | Yes | No | N/A |
| 5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met? | Yes | No | N/A | Yes | No | N/A |
| 6) MS/MSD Criteria Met? | Yes | No | N/A | Yes | No | N/A |

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

NA
Project Manager Signature Date

NA
QA Officer Signature Date

## GENERAL COMMENTS

# DQO Report for SDG
ARS1-14-03068



| Analysis Code | Group | PrepType | Isotope | Activity Units | Aliquot Units | ProcedureNo | RDL | LCS_LL | LCS_UL | MS_LL | MS_UL | RadY_LL | RadY_UL | GravY_LL | GravY_LL | RER | RPD | DiltionReq | BlankCorrectionMDA | BlankCorrectionAll | CountTimeReq | AliquotRequired |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSC-A-021 | STD | WRAD | H-3 | pCi | L | ARS-054 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | |
| LSC-A-022 | STD | WRAD | Enriched H-3 | pCi | L | ARS-040 | 0.00E+00 | 75 | 125 | 60 | 140 | 30 | 110 | 40 | 110 | 1.00 | 25 | FALSE | FALSE | FALSE | FALSE | |

# SDG Report - Samples and Containers

**SDG Specific Data**

| | | | | | |
|---|---|---|---|---|---|
| SDG | ARS1-14-03068 | TAT Days | 28 | Project Type | Environmental |
| Sample Count | Rpt Level 4 | Date Received | 11/6/2014 | COC Number | 2015-230 |
| Client | Los Alamos National Laboratory | Client Deadline | 12/4/2014 | PO Number | |
| Client Code | 114 | Internal Deadline | 12/3/2014 | Job Number | |
| Profile Number | PN-00094 | Lab Deadline | 12/1/2014 | Job Location | |
| Comments | | | | | |

**Samples and Containers (➔) Checked In Thus Far**

| FR | ClientID | Matrix | SampleStartDate | SampleEndDate | Disp | Hold | Arch | Storage | X | Units | Y | Units | Z | Units | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | CAWR-14-89229 | AQ | 10/30/14 01:40 PM | 10/30/14 01:40 PM | H | 90 | 5 | M5 | | | | | | | |
| ➔ | IC_ID | Cnt | Volume_mL | Wt_g | pH_Orig | pH_Final | CPM | uR_Hr | Storage | VOA | Head Sp | AF Units | AF Rate | AF Mins | AF Total Vol |
| | 180654 | 1 | 1000.00 | | | | 70 | 26 | | N | N/A | | | | |
| 002 | CAWR-14-89222 | AQ | 10/30/14 01:40 PM | 10/30/14 01:40 PM | H | 90 | 5 | M5 | | | | | | | |
| ➔ | IC_ID | Cnt | Volume_mL | Wt_g | pH_Orig | pH_Final | CPM | uR_Hr | Storage | VOA | Head Sp | AF Units | AF Rate | AF Mins | AF Total Vol |
| | 180655 | 1 | 1000.00 | | | | 70 | 26 | | N | N/A | | | | |

# SDG Report - Analysis Assignments

| | | | |
|---|---|---|---|
| Temp SDG | ARS1-14-03068 | Sample Count | 2 |
| Client | Los Alamos National Laboratory | Analysis Count | 2-4 |

**Samples Count Totals per Analysis**

| Analysis Code | Analysis Description | Samples Count |
|---|---|---|
| LSC-A-021 | Low Level Tritium Screen in (Aqueous) | 2 |
| LSC-A-022 | Low Level Tritium by Enrichment Process in (Aqueous [AQ]) | 2 |

**Analyses Assigned Per Fraction**

| Fraction | Analysis Code | X = Assigned |
|---|---|---|
| 001 | LSC-A-021 | X |
| 001 | LSC-A-022 | X |
| 002 | LSC-A-021 | X |
| 002 | LSC-A-022 | X |

# ARS FILE TRACKING SHEET

**SDG:** ARS1-14-03068

| Task | Date / Time | Initials |
|---|---|---|
| Date & Time Samples Received | 11-06-14 14:20 | JRN |
| ICOC Initiated/Storage Location: M5 | 11-06-14 16:21 | JRN |
| Technical Checks Performed | See Batch | |
| Report Written / EDD Generated 12-8-14 / 1227 \| SDL | 12-9-14 \| 941 | SDL |
| Quality Assurance Checks Performed on Report | 12-9-14 1444 | JDT |
| Management Checks Performed on Report | | |
| *Preliminary Report Scan* | | |
| Report E-mailed/Faxed | | |
| Invoice Completed Invoice #:_____ | | |
| Requires Report Mailed Yes / ~~No~~ | | |
| Requires Original COC mailed Yes / ~~No~~ | | |
| Report Reviewed and Imaged | | |

EDD Loaded SDL 12-8-14

## SPECIAL REQUIREMENTS

| Requirement | Yes | No |
|---|---|---|
| 3 Hour Rush | ☐ | ☑ |
| 24 Hour Rush | ☐ | ☑ |
| 48 Hour Rush | ☐ | ☑ |
| 3 Day Rush | ☐ | ☑ |
| 5 Day Rush | ☐ | ☑ |
| 10 Day Rush | ☐ | ☑ |
| Standard Oil/Gas Client (5 Day) | ☐ | ☑ |
| Standard Turnaround | ☑ | ☐ |

**NOTES**

See

ARS-062-005 r6

**COMPANY NAME:** LANL

**SDG:** ARS1-14-03068

**SHIPPING CONTAINER**

| | | |
|---|---|---|
| Good Condition | ✓ Yes | No |
| Radioactive | Yes | ✓ No |
| UN2910 | Yes | ✓ No |
| Sec. Seals | ✓ Yes | No |
| Seals Intact | ✓ Yes | No / N/A |
| Air Bill | Yes | ✓ No |

**COC PRESENT WITH SAMPLES**

| | | |
|---|---|---|
| COC | ✓ Yes | No |

**SAMPLE CONTAINER(S)**

| | | |
|---|---|---|
| Good Condition | ✓ Yes | No |
| Sec. Seals | ✓ Yes | No |
| Seal Intact | ✓ Yes | No / N/A |
| Marked Radioactive | Yes | ✓ No |

# Samples Rcv

Matrix [ AF . AQ . BI . FE . LT . SI . SO . UR . VG ]

**External and Internal Surveys**

| | | | | | |
|---|---|---|---|---|---|
| Exposure Rate Meter | M3 242861 | Serial No. | PR 264266 | Calibration Due Date | 4/16/15 |
| Count Rate Meter | M2 154859 | Serial No. | PR 184559 | Calibration Due Date | 4/16/15 |

| | | | | |
|---|---|---|---|---|
| Background Exposure Rate (µR/hr) | 26 | Max Exposure Rate on Shipping Containers Externals (Plus Bkgd) | 26 | µR/hr |
| Background Count Rate (cpm) | 70 | Max Removable Count Rate on Shipping Containers Externals (Plus Bkgd) | 70 | cpm |
| | | Max Removable Count Rate on Shipping Containers Internals (Plus Bkgd) | 80 | cpm |

| Sample Label/Comments/Notes | pH Orig (pH > 2 is Acceptable) | pH Final | Mark if Preserve | Acid Lot # | Weight(g) / Volume(mL) | µR/hr (Acceptance Limits <500 µR/hr) | cpm (Acceptance Limits <100 cpm/cm²) |
|---|---|---|---|---|---|---|---|
| CAWR-14-89229 | | 11/6/14 | ☐ | | 1000 mL | 26 | 70 |
| CAWR-14-89222 | | | ☐ | | 1000 mL | 26 | 70 |
| | | | ☐ | | | | |
| | | | ☐ | | | | |
| | | | ☐ | | | | |
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| | | | ☐ | | | | |
| | | | ☐ | | | | |

Surveyors' Name: [signature]

Date/Time Surveyed: 11/6/14 14:20

American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge LA 70806

# Chain of Custody/Analysis Request

ADep

COC/Lab Request #: 2015-230



**Client Contact:**

**Lab Agreement #** : 63641-001-10
**Project Number** :
**Analysis Turnaround Time:**
24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

**Site Name:** Los Alamos National Laboratory

**Rad Screening Info:** Yes, Below Background

**Lab Reporting Limit Type:** Sample Quantitation Limit

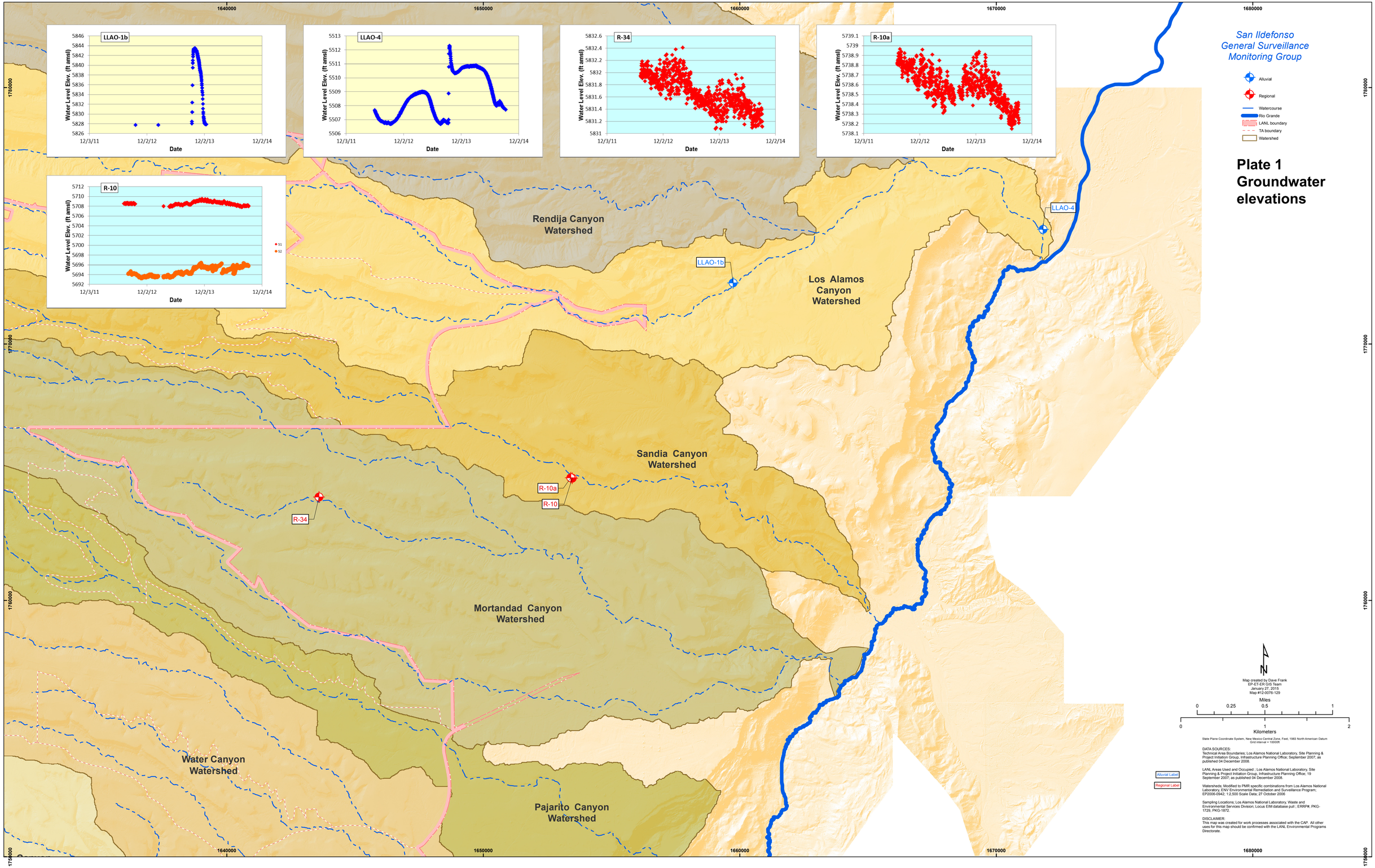
**Special Instructions:**

| Field Sample ID | Sample Date | Sample Time | Sample Matrix | WSP-LL-H-3 |
|---|---|---|---|---|
| CAWR-14-89229 | Oct 30 2014 | 13:40 | W | 1 |
| CAWR-14-89222 | Oct 30 2014 | 13:40 | W | 1 |

Special Instructions:

| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
|---|---|---|---|---|---|
| | Melissa Martinez | 11/5/14 3:00 | | Cheryl G. Reaves | 11/6/14 11:30 |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |
| Relinquished by: | Print Name: | Date/Time: | Received by: | Print Name: | Date/Time: |

9 of 10


LLAO-1b
Water Level Elev. (ft amsl)
Date
LLAO-4
R-34
R-10a
R-10
S1
S2
Rendija Canyon Watershed
Los Alamos Canyon Watershed
Sandia Canyon Watershed
Mortandad Canyon Watershed
Water Canyon Watershed
Pajarito Canyon Watershed
R-10a
R-10
R-34
LLAO-1b
LLAO-4
1640000
1650000
1660000
1670000
1680000
1780000
1770000
1760000
1750000
San Ildefonso General Surveillance Monitoring Group
Alluvial
Regional
Watercourse
Rio Grande
LANL boundary
TA boundary
Watershed
Plate 1
Groundwater elevations
N
Map created by Dave Frank
EP-ET-ER GIS Team
January 27, 2015
Map #12-0076-129
Miles
0
0.25
0.5
1
Kilometers
0
1
2
State Plane Coordinate System, New Mexico Central Zone, Feet, 1983 North American Datum
Grid interval = 10000ft
DATA SOURCES:
Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 04 December 2008.
LANL Areas Used and Occupied ; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 04 December 2008.
Watersheds; Modified to PMR specific combinations from Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; EP2006-0942; 1:2,500 Scale Data; 27 October 2006
Sampling Locations; Los Alamos National Laboratory, Waste and Environmental Services Division; Locus EIM database pull ; ERRP#, PKG-1729, PKG-1872.
DISCLAIMER:
This map was created for work processes associated with the CAP. All other uses for this map should be confirmed with the LANL Environmental Programs Directorate.
Alluvial Label
Regional Label